

THE CANCER BURDEN IN MICHIGAN



SELECTED STATISTICS 1993-2011

Prepared by the Michigan Public Health Institute (MPHI) Cancer Epidemiology and Evaluation
Cancer Staff in support of the Michigan Comprehensive Cancer Control Program (CCC) and the
Michigan Cancer Consortium (MCC)



September 2011

| | |
|---|---|
| Background | 1 |
| Selected Cancer Sites | 2 |
| Time Trends | 3 |
| Cancer-Related Behavioral Risk Factors | 4 |
| Human Cost..... | 5 |
| Appendix I (Additional Resources)..... | 6 |
| Appendix II (County Tables) | 7 |

Background

This report describes the cancer burden in Michigan using cancer morbidity and mortality data, and the human costs associated with cancer. Six cancer sites are presented: breast, cervical, colorectal, lung, prostate and ovarian cancer. Throughout this report, breast cancer statistics refer to female breast cancer only.

Presented in this report are epidemiological analyses of cancer mortality from years 1994 to 2008 and cancer incidence from 1993 to 2007 for the selected cancer sites.¹ Mortality data are from the Michigan Resident Death Files and incidence data are from the Michigan Resident Cancer Incidence File, which are both provided by the Michigan Department of Community Health, Division of Vital Records and Health Statistics.^{2,3} Michigan rates are compared with national mortality and incidence rates from the SEER Cancer Statistics Review, which is produced by the National Cancer Institute.⁴ Unless otherwise specified, all incidence and mortality rates referred to in the text are age-adjusted according to the 2000 standard U.S. population.

Also presented are data on the stage at diagnosis for cases reported in Michigan and relative survival rates for the selected cancer sites. Relative survival rates were obtained from the SEER Cancer Statistics Review.⁴

Comparisons of incidence and mortality rates amongst Michigan counties and changes in the percentage of cancer cases diagnosed at an early stage in individual counties are presented.

A summary of data on cancer-related behavioral risk factors is also included. Behavioral data for Michigan residents were obtained from three published reports: the Michigan Behavioral Risk Factor Survey (BRFSS),⁵ the Michigan Youth Risk Behavior Survey (YRBS),⁶ and the Special Cancer Behavioral Risk Factor Survey (SCBRFS).⁷ Additionally, selected measures from the Health Plan Employer Data and Information Set (HEDIS®) are reported. HEDIS data were obtained from the Quality Compass® 2010, a registered trademark of The National Committee for Quality Assurance.⁸

¹ Whenever possible, the data quoted in this report are the most recent available. Frequently, there is an 18- to 24-month interval between the time a cancer is diagnosed and the time that information is available from the Michigan Cancer Surveillance Program. However, cancer mortality data for any given year generally are available within several months after the close of that calendar year; the mortality data that are available often are more recent than the incidence data.

² Michigan Cancer Surveillance Program. (2010). *Michigan Cancer Death Public Use File 1985-2008*. Michigan Department of Community Health (MDCH), Division for Vital Records & Health Statistics.

³ Michigan Cancer Surveillance Program. (2011). *Michigan Cancer Incidence Public Use File 1985-2007*. Michigan Department of Community Health (MDCH), Division for Vital Records & Health Statistics.

⁴ National Cancer Institute. (2011). *SEER Cancer Statistics Review, 1975-2008*. Retrieved from: www.seer.cancer.gov/csr/1975_2008/index.html

⁵ Michigan Department of Community Health (2011). *Behavioral Risk Factor Survey: Preliminary Estimates for Risk Factors and Health Indicators 2010*. Retrieved July 5, 2011 at http://www.michigan.gov/documents/mdch/2010_MiBRFS_Standard_Tables_FINAL_350512_7.pdf

⁶ Michigan Department of Education (2010). *Michigan Youth Risk Behavior Survey: Detailed Results by Item 2009*. Retrieved at: <http://www.michigan.gov/yrbs>.

⁷ Michigan Public Health Institute and Michigan Department of Community Health (2010). *Special Cancer Behavioral Risk Factor Survey 2008*. Retrieved at: <http://www.michigancancer.org/Resources/SpecialMCCReports.cfm>

⁸ National Committee for Quality Assurance (NCQA). (2011). *Quality Compass; HEDIS 2010*. Retrieved at: <http://www.qualitycompass.org>.

Analyses of years of life lost due to the selected cancers are presented for Michigan and the United States. Data for the United States were taken from the SEER Cancer Statistics Review,⁴ and United States 2006 Life Tables were used to calculate years of life lost in Michigan as well as nationally.⁹

Appendix I provides additional resources that are utilized for cancer researchers. Appendix II includes charts of incidence and mortality rates by county.

An electronic copy of the full report is available on the Michigan Cancer Consortium (MCC) website at: <http://www.michigancancer.org/WhatWeDo/TheCancerBurdenMichiganSelectedStatistics.cfm>

⁹ National Center for Health Statistics. (2010). *United States Life Tables, 2006*; National Vital Statistics Reports; Vol 58 No 21. Retrieved at: http://www.cdc.gov/nchs/products/life_tables.htm.

Selected Cancer Sites: Table of Contents

| | |
|---|-----------|
| Selected Cancer Sites: | 1 |
| Table of Contents | 1 |
| Background | 4 |
| Summary | 6 |
| All Cancer Sites | 7 |
| Table 1: Number of Cancer Deaths and New Cancer Cases by Age Group and Gender, All Sites, Michigan..... | 7 |
| Table 2: Cancer Mortality and Incidence Rates by Gender and Race, All Sites, Michigan..... | 7 |
| Breast Cancer | 8 |
| Table 3: Estimated Number of Breast Cancer Deaths and New Cases, Michigan 2011 | 8 |
| Table 4: Age-Adjusted Breast Cancer Mortality Rate Ranking, Michigan vs. US, 2003-2007 | 8 |
| Table 5: Age-Specific Breast Cancer Deaths and New Breast Cancer Cases, Michigan 2007-2008..... | 8 |
| Table 6: Breast Cancer Mortality Rates, Michigan 2008 vs. US 2007 | 9 |
| Table 7: Breast Cancer Incidence Rates, Michigan vs. US, 2007 | 9 |
| Table 8: Age- and Race-Specific Breast Cancer Mortality Rates, Michigan 2008 | 9 |
| Table 9: Age- and Race-Specific Female Breast Cancer Incidence Rates, Michigan 2007..... | 10 |
| Table 10: Female Breast Cancer Five-Year Relative Survival Rates by Stage at Diagnosis and Race, US 2001-2007 | 10 |
| Table 11: Female Breast Cancer Five-Year Relative Survival Rates by Stage at Diagnosis and Race, Michigan 1998* | 11 |
| Table 12: Numbers and Percentages of Invasive Female Breast Cancer (Primary Site) by Stage at Diagnosis and Race, Michigan 2007 | 11 |
| Figure 1: Percentage of Female Breast Cancer Cases Localized at Diagnosis by County | 13 |
| Cervical Cancer | 14 |
| Table 13: Estimated Number of New Cervical Cancer Cases, Michigan 2011 | 14 |
| Table 14: Cervical Cancer Mortality Rates, Michigan 2008 vs. US 2007 | 14 |
| Table 15: Cervical Cancer Incidence Rates, Michigan vs. US, 2007 | 14 |

| | |
|--|-----------|
| Table 16: Age- and Race-Specific Cervical Cancer Mortality Rates, Michigan 2008..... | 15 |
| Table 17: Age- and Race-Specific Cervical Cancer Incidence Rates, Michigan 2007 | 15 |
| Table 18: Cervical Cancer Five-Year Relative Survival Rates by Stage at Diagnosis, Age and Race, US 2001-2007..... | 16 |
| Table 19: Numbers and Percentages of Invasive Cervical Cancer (Primary Site) by Stage at Diagnosis and Race, Michigan 2007..... | 16 |
| Figure 2: Percentage of Cervical Cancer Cases In-situ at Diagnosis by County..... | 18 |
| Colorectal Cancer | 19 |
| Table 20: Estimated Number of Colorectal Cancer Deaths and New Colorectal Cancer Cases, Michigan 2011..... | 19 |
| Table 21: Colorectal Cancer Mortality Rates by Gender and Race, Michigan 2008 vs. US 2007..... | 19 |
| Table 22: Colorectal Cancer Incidence Rates by Gender and Race, Michigan vs. US, 2007 | 20 |
| Table 23: Age- and Gender-Specific Colorectal Cancer Mortality Rates, Michigan 2008..... | 20 |
| Table 24: Age- and Gender-Specific Colorectal Cancer Incidence Rates, Michigan 2007 | 21 |
| Table 25: Colorectal Cancer Five-Year Relative Survival Rates by Stage at Diagnosis, Race and Gender, US 2001-2007..... | 21 |
| Table 26: Numbers and Percentages of Invasive Colorectal Cancer (Primary Site) by Stage at Diagnosis and Race, Michigan 2007 | 21 |
| Figure 3: Percentage of Colorectal Cancer Cases Localized at Diagnosis by County | 22 |
| Lung Cancer | 23 |
| Table 27: Estimated Number of Lung Cancer Deaths and New Lung Cancer Cases, Michigan 2011 .. | 23 |
| Table 28: Lung Cancer Mortality Rates by Gender and Race, Michigan 2008 vs. US 2007..... | 23 |
| Table 29: Lung Cancer Incidence Rates by Gender and Race, Michigan vs. US, 2007 | 24 |
| Table 30: Age- and Gender-Specific Lung Cancer Mortality Rates, Michigan 2008 | 24 |
| Table 31: Age- and Gender-Specific Lung Cancer Incidence Rates, Michigan 2007..... | 24 |
| Table 32: Lung Cancer Five-Year Relative Survival Rates by Stage at Diagnosis, Race and Gender, US 2001-2007..... | 25 |
| Table 33: Numbers and Percentages of Invasive Lung Cancer Cases (Primary Site) by Stage at Diagnosis and Race, Michigan 2007 | 25 |
| Prostate Cancer | 26 |
| Table 34: Estimated Number of Prostate Cancer Deaths and New Prostate Cancer Cases, Michigan 2011 | 26 |
| Table 35: Prostate Cancer Mortality Rates by Race, Michigan 2008 vs. US 2007..... | 26 |
| Table 36: Prostate Cancer Incidence Rates by Race, Michigan vs. US 2007 | 26 |
| Table 37: Age- and Race-Specific Prostate Cancer Mortality Rates, Michigan 2008 | 27 |

| | |
|--|-----------|
| Table 38: Age- and Race-Specific Prostate Cancer Incidence Rates, Michigan 2007 | 27 |
| Table 39: Prostate Cancer Five-Year Relative Survival Rates by Stage at Diagnosis and Race, US 2001-2007..... | 27 |
| Table 40: Numbers and Percentages of Invasive Prostate Cancer (Primary Site) by Stage at Diagnosis and Race, Michigan 2007..... | 28 |
| Figure 4: Percentage of Prostate Cancer Cases Localized at Diagnosis by County | 29 |
| Ovarian Cancer | 30 |
| Table 41: Estimated Number of Ovarian Cancer Deaths, Michigan 2011 | 30 |
| Table 42: Ovarian Cancer Mortality Rates by Race, Michigan 2008 vs. US 2007 | 30 |
| Table 43: Ovarian Cancer Incidence Rates by Race, Michigan vs. US 2007 | 30 |
| Table 44: Age- and Race-Specific Ovarian Cancer Mortality Rates, Michigan 2008 | 31 |
| Table 45: Age- and Race-Specific Female Ovarian Cancer Incidence Rates, Michigan 2007 | 31 |
| Table 46: Ovarian Cancer Five-Year Relative Survival Rates by Stage at Diagnosis and Race, US 2001-2007..... | 32 |
| Table 47: Numbers and Percentages of Ovarian Cancer (Primary Site) by Stage at Diagnosis and Race, Michigan 2007..... | 32 |

Background

This section of the report presents the findings of epidemiological analyses of cancer mortality and incidence for the six selected cancer sites: breast, cervical, colorectal, lung, prostate and ovarian cancer. The number of estimated cancer deaths and estimated new cancer cases for 2011 were obtained from the American Cancer Society Cancer Facts and Figures 2011 report.¹

Michigan Mortality, Incidence, and Survival Rates

The 2008 age-adjusted mortality rates and 2007 age-adjusted incidence rates are shown for the selected cancers.^{2,3} Age-adjusted mortality and incidence rates were calculated by the direct age-adjustment method, using the 2000 U.S. population age distribution as the standard population, to allow comparisons across population subgroups.

Age-adjusted mortality and incidence rates were compared between gender and racial groups, and age-specific rates were computed. A comparison of age-adjusted incidence and mortality rates between Michigan and the U.S. is made using data from the National Cancer Institute's SEER Cancer Statistics Review, 1975-2007.⁴ A comparison of the proportions of cases diagnosed at different stages by gender and race highlights disparities where they exist.

National data on five-year relative survival rates is from the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute (NCI).⁴ The relative survival rates in this report represent the likelihood that a patient diagnosed will not die from causes associated specifically with the given cancer before five years after their initial cancer diagnosis.

¹ American Cancer Society. (2011). *Cancer Facts and Figures 2011*. Retrieved from:

<http://www.cancer.org/acs/groups/content/@epidemiologysurveillance/documents/document/acspc-026238.pdf>

² Michigan Cancer Surveillance Program. (2010). *Michigan Cancer Death Public Use File 1985-2008*. Michigan Department of Community Health (MDCH), Division for Vital Records & Health Statistics.

³ Michigan Cancer Surveillance Program. (2010). *Michigan Cancer Incidence Public Use File 1985-2007*. Michigan Department of Community Health (MDCH), Division for Vital Records & Health Statistics.

⁴ National Cancer Institute. (2011). *SEER Cancer Statistics Review, 1975-2008*. Retrieved from: www.seer.cancer.gov/csr/1975_2008/index.html

Interpretation of cancer trends by county must take into consideration the various factors contributing to changes in stage at diagnosis at the county level. One limitation to consider is the low number of cancer cases in some counties. Several counties had fewer than 20 reported cases for at least one of the time periods and cancer sites. Therefore, a decrease in the percentage of cases localized at diagnosis could reflect a relatively small change in the number of cases at each stage. Also, it is important to note that changes in reporting and staging practices could have changed over time within a county. Usually increases in the percentage of cases localized or in-situ at diagnosis can be associated with an increase in screening but an equivalent decline in the percentage localized or in-situ does not necessarily reflect changes in prevention practices or quality of care.

Summary

Tables 1 and 2 show number of deaths due to cancer and new cancer cases at all sites combined. When looking at all cancer sites combined more cancer deaths occur in the population aged 75 years and older. Mortality from all cancer sites combined is greater among black residents than among white residents of Michigan. Black men are 1.2 times more likely to be diagnosed with cancer than white men, whereas black women and white women are at a similar risk to be newly diagnosed with cancer.

Tables showing statistics for six sites follow: breast cancer (Tables 3 through 12), cervical cancer (Tables 13 through 19), colorectal cancer (Tables 20 through 26), lung cancer (Tables 27 through 33), prostate cancer (Tables 34 through 40), and ovarian cancer (Tables 41 through 47).

Cancer mortality and incidence rates generally increase with increasing age for each of the selected cancer sites. There were 7890 new cases of breast cancer identified in 2011, 550 more than in 2010 (table 3). Female breast cancer incidence rates increase with age. Age adjusted rates of breast cancer in Michigan were slightly lower compared to the national rate (table 7).

Cervical cancer incidence rates peak at age 30 to 49 years, slightly decrease and increase again for women age 60 to 69 years. Prostate cancer mortality rates increase dramatically among men age 65 years and older and prostate cancer incidence rates increase sharply among men beginning at age 50 years.

There were 4,800 new cases of colorectal cancer diagnosed in 2011, 70 less than in 2010. There were another 4,800 deaths attributed to colorectal cancer in 2011, 370 less than in 2010 (table 17). Mortality rates for colorectal cancer increase with increasing age.

Mortality and incidence rates for breast, cervical, colorectal, lung, and prostate cancers are higher among blacks than among whites. However, prostate cancer mortality rates have the greatest disparity between races, as the mortality rate among black men is more than twice that among white men. Mortality and incidence rates for ovarian cancer are higher for white women compared to black women.

Five-year relative survival rates in the U.S. reveal a disparity in survival between blacks and whites. For breast, cervical, colorectal, lung, and ovarian cancers, blacks have a lower survival rate than whites, even when cancers are detected at the same stage. When prostate cancer is detected at a localized or regional stage, the five-year survival rates are 100% for white and black men.

Significant differences were seen in incidence and mortality rates over a ten-year period among counties for breast, cervical, colorectal, lung, prostate, and ovarian cancer sites. An increase in early stage diagnosis was most dramatically seen for prostate cancer.

All Cancer Sites

Table 1: Number of Cancer Deaths and New Cancer Cases by Age Group and Gender, All Sites, Michigan

| | | All Ages | Under 35 | 35-54 | 55-74 | 75 and Over |
|---------------------------|----------------|----------|----------|-------|--------|-------------|
| Deaths 2008 | Total | 20,159 | 209 | 2,323 | 8,705 | 8,922 |
| | Males | 10,372 | 116 | 1,135 | 4,690 | 4,431 |
| | Females | 9,787 | 93 | 1,188 | 4,015 | 4,491 |
| New Cases 2007 | Total | 52,607 | 1,683 | 9,994 | 25,763 | 15,167 |
| | Males | 27,543 | 726 | 4,244 | 14,725 | 7,848 |
| | Females | 25,046 | 957 | 5,746 | 11,030 | 7,313 |

Table 2: Cancer Mortality and Incidence Rates by Gender and Race, All Sites, Michigan

| | | Rate per 100,000* | | | Rate Ratio |
|---------------------------|----------------|-------------------|--------|--------|---------------|
| | | Total Population | Whites | Blacks | Blacks/Whites |
| Mortality 2008 | Total | 185.5 | 180.3 | 225.6 | 1.3 |
| | Males | 223.3 | 215.8 | 288.1 | 1.3 |
| | Females | 160.0 | 156.4 | 185.7 | 1.2 |
| Incidence 2007 | Total | 489.1 | 476.1 | 520.8 | 1.1 |
| | Males | 573.3 | 549.9 | 648.9 | 1.2 |
| | Females | 429.9 | 425.5 | 433.1 | 1.0 |

*Rates are age-adjusted and computed by race and gender.

Breast Cancer

Table 3: Estimated Number of Breast Cancer Deaths and New Cases, Michigan 2011

| | |
|-------------------|-------|
| Deaths | 1,320 |
| New Cases* | 7,890 |

*Excludes in situ carcinomas.

Note: Numbers are rounded to the nearest 10.

Table 4: Age-Adjusted Breast Cancer Mortality Rate Ranking, Michigan vs. US, 2003-2007

| Female Breast | Rate* | Rank** |
|----------------------|--------------|---------------|
| Michigan | 24.5 | 16 |
| US | 24.0 | - |

* Rate per 100,000 gender-specific population.

**Ranking out of 50 states and the District of Columbia with 1 being the highest mortality rate.

Note: Rates exclude in situ carcinomas.

Table 5: Age-Specific Breast Cancer Deaths and New Breast Cancer Cases, Michigan 2007-2008

| | All Ages | 25-39 | 40-49 | 50-64 | 65 Years and Over |
|------------------------|-----------------|--------------|--------------|--------------|--------------------------|
| Deaths, 2008 | 1,471 | 46 | 132 | 445 | 848 |
| New Cases, 2007 | 6,908 | 345 | 1,134 | 2,543 | 2,883 |

Table 6: Breast Cancer Mortality Rates, Michigan 2008 vs. US 2007

| | Number in Michigan (2008) | Age-Adjusted Rate* | |
|---------------|------------------------------|--------------------|----------------|
| | | Michigan (2008) | US-SEER (2007) |
| Total | 1,471 | 24.2 | 22.8 |
| Whites | 1,198 | 22.9 | 22.2 |
| Blacks | 260 | 35.9 | 31.4 |

*Rate per 100,000 race- and gender-specific population.

Table 7: Breast Cancer Incidence Rates, Michigan vs. US, 2007

| | Number in Michigan | Age-Adjusted Rate* | |
|---------------|-----------------------|--------------------|---------|
| | | Michigan | US-SEER |
| Total | 6,908 | 119.2 | 124.7 |
| Whites | 5,802 | 117.1 | 127.4 |
| Blacks | 827 | 115.6 | 113.1 |

*Rate per 100,000 race- and gender-specific population.

Table 8: Age- and Race-Specific Breast Cancer Mortality Rates, Michigan 2008

| Age (Years) | Total (All Races) | | White | | Black | |
|---------------------|-------------------|-------|--------|-------|--------|-------|
| | Number | Rate* | Number | Rate* | Number | Rate* |
| 25-39 | 46 | 4.8 | 33 | 4.5 | 13 | 7.9 |
| 40-49 | 132 | 17.6 | 98 | 15.9 | 32 | 29.9 |
| 50-64 | 445 | 45.3 | 333 | 40.1 | 105 | 82.0 |
| 65 and Older | 848 | 113.0 | 734 | 110.9 | 110 | 141.8 |

*Rate per 100,000 age, gender, and race-specific population.

Table 9: Age- and Race-Specific Female Breast Cancer Incidence Rates, Michigan
2007

| Age (Years) | Total (All Races) | | White | | Black | |
|---------------------|-------------------|-------|--------|-------|--------|-------|
| | Number | Rate* | Number | Rate* | Number | Rate* |
| 25-39 | 345 | 35.6 | 259 | 34.3 | 60 | 36.0 |
| 40-49 | 1,134 | 147.3 | 926 | 145.4 | 157 | 144.2 |
| 50-64 | 2,543 | 264.2 | 2,093 | 257.0 | 329 | 263.0 |
| 65 and Older | 2,883 | 389.7 | 2,521 | 386.4 | 281 | 366.9 |

*Rate per 100,000 age, gender, and race-specific population.

Table 10: Female Breast Cancer Five-Year Relative Survival Rates by Stage at
Diagnosis and Race, US 2001-2007

| | All Races | White | Black |
|-------------------|-----------|-------|-------|
| All stages | 89.1 | 90.4 | 77.0 |
| Localized | 98.6 | 99.3 | 92.6 |
| Regional | 83.8 | 85.2 | 72.1 |
| Distant | 23.4 | 24.9 | 15.0 |
| Unknown | 52.4 | 52.0 | 45.2 |
| In Situ* | 100.0 | 100.0 | 100.0 |

**In situ* cases are not included in the All Stages group.

Table 11: Female Breast Cancer Five-Year Relative Survival Rates by Stage at Diagnosis and Race, Michigan 1998*

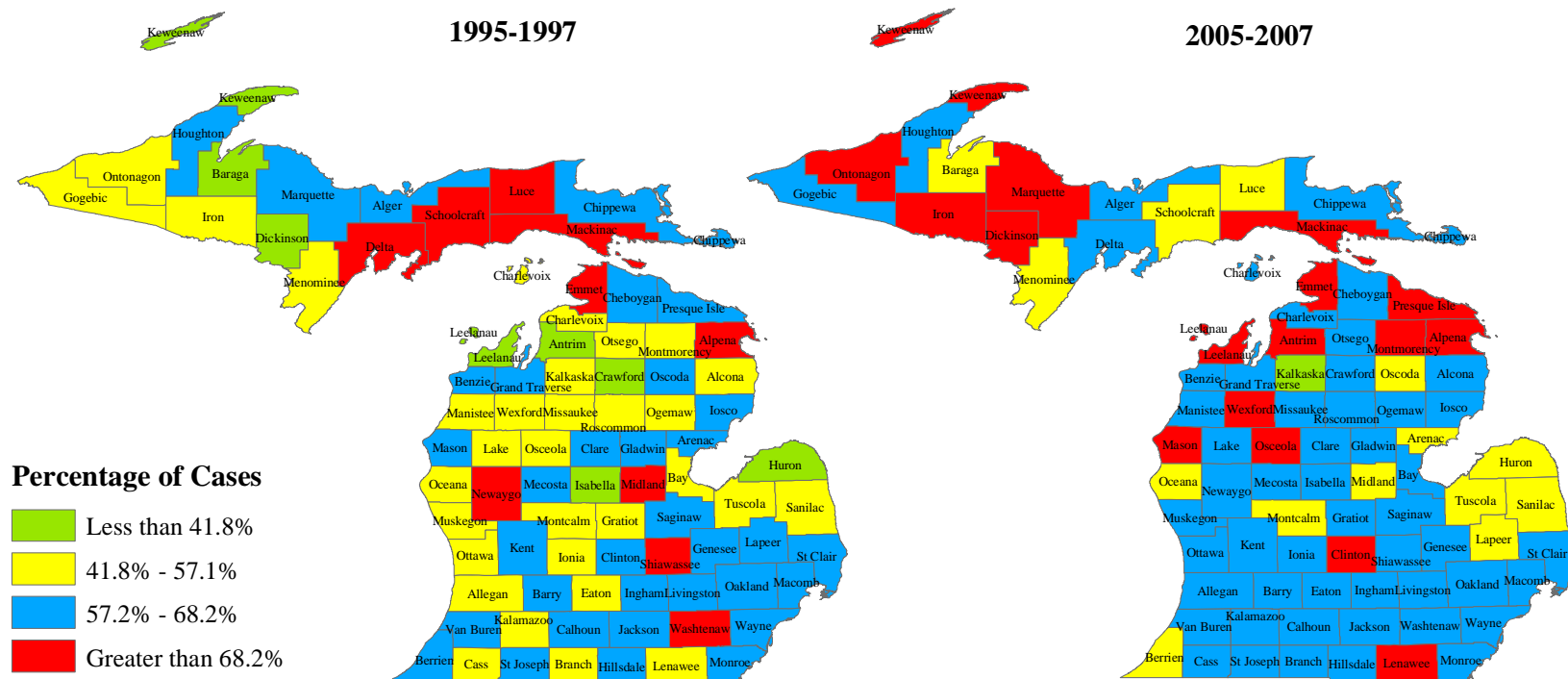
| | Total % | White % | Black % |
|-------------------|----------------|----------------|----------------|
| All stages | 84.4 | 85.6 | 74.5 |
| Localized | 94.3 | 94.6 | 91.3 |
| Regional | 71.1 | 73.0 | 60.4 |
| Distant | 21.4 | 22.9 | 15.2 |
| Unknown | 82.0 | 83.7 | 71.8 |

*Five-year relative survival rates for cases diagnosed in 1998 that were still known to be alive in 2003

Table 12: Numbers and Percentages of Invasive Female Breast Cancer (Primary Site) by Stage at Diagnosis and Race, Michigan 2007

| | Total Number | Localized | | Regional | | Distant | | Unknown | |
|---------------|-------------------------|------------------|----------|-----------------|----------|----------------|----------|----------------|----------|
| | | Number | % | Number | % | Number | % | Number | % |
| Total | 6,908 | 4,415 | 63.9 | 1,872 | 27.1 | 344 | 5.0 | 277 | 4.0 |
| Whites | 5,802 | 3,788 | 65.3 | 1,507 | 26.0 | 262 | 4.5 | 245 | 4.2 |
| Blacks | 827 | 442 | 53.5 | 283 | 34.2 | 76 | 9.2 | 26 | 3.1 |

Figure 1: Percentage of Female Breast Cancer Cases Localized at Diagnosis by County



Cervical Cancer

Table 13: Estimated Number of New Cervical Cancer Cases, Michigan 2011

| New Cases* | 360 |
|------------|-----|
|------------|-----|

*Excludes in situ carcinomas.

Note: Numbers are rounded to the nearest 10. Cervical cancer mortality estimates are not available.

Table 14: Cervical Cancer Mortality Rates, Michigan 2008 vs. US 2007

| | Number in Michigan (2008) | Age-Adjusted Rate* | |
|---------------|------------------------------|--------------------|----------------|
| | | Michigan (2008) | US-SEER (2007) |
| Total | 116 | 2.0 | 2.4 |
| Whites | 86 | 1.8 | 2.2 |
| Blacks | 25 | 3.4 | 4.4 |

*Rate per 100,000 race and gender-specific population.

Table 15: Cervical Cancer Incidence Rates, Michigan vs. US, 2007

| | Number in Michigan | Age-Adjusted Rate* | |
|---------------|-----------------------|--------------------|---------|
| | | Michigan | US-SEER |
| Total | 412 | 8.0 | 8.1 |
| Whites | 322 | 7.7 | 7.9 |
| Blacks | 80 | 11.3 | 10.1 |

*Rate per 100,000 race and gender-specific population.

Table 16: Age- and Race-Specific Cervical Cancer Mortality Rates, Michigan 2008

| Age (years) | Total (All Races) | | White | | Black | |
|---------------------|-------------------|-------|--------|-------|--------|-------|
| | Number | Rate* | Number | Rate* | Number | Rate* |
| 20-29 | 3 | 0.5 | 3 | 0.6 | 0 | 0.0 |
| 30-39 | 11 | 1.7 | 5 | 1.0 | 6 | 5.5 |
| 40-49 | 18 | 2.4 | 14 | 2.3 | 1 | 0.9 |
| 50-59 | 27 | 3.8 | 19 | 3.2 | 8 | 8.3 |
| 60-69 | 27 | 5.7 | 19 | 4.7 | 6 | 11.0 |
| 70 and older | 30 | 5.5 | 26 | 5.4 | 4 | 7.2 |

*Rate per 100,000 age, gender, and race-specific population.

Table 17: Age- and Race-Specific Cervical Cancer Incidence Rates, Michigan 2007

| Age (Years) | Total (All Races) | | White | | Black | |
|---------------------|-------------------|-------|--------|-------|--------|-------|
| | Number | Rate* | Number | Rate* | Number | Rate* |
| 20-29 | 31 | 4.7 | 28 | 5.3 | 1 | 0.9 |
| 30-39 | 98 | 15.2 | 79 | 15.8 | 15 | 13.5 |
| 40-49 | 111 | 14.4 | 90 | 14.1 | 21 | 19.3 |
| 50-59 | 61 | 8.7 | 46 | 7.8 | 14 | 14.8 |
| 60-69 | 52 | 11.5 | 33 | 8.4 | 18 | 34.8 |
| 70 and older | 59 | 10.8 | 46 | 9.5 | 11 | 19.9 |

*Rate per 100,000 age, gender, and race-specific population.

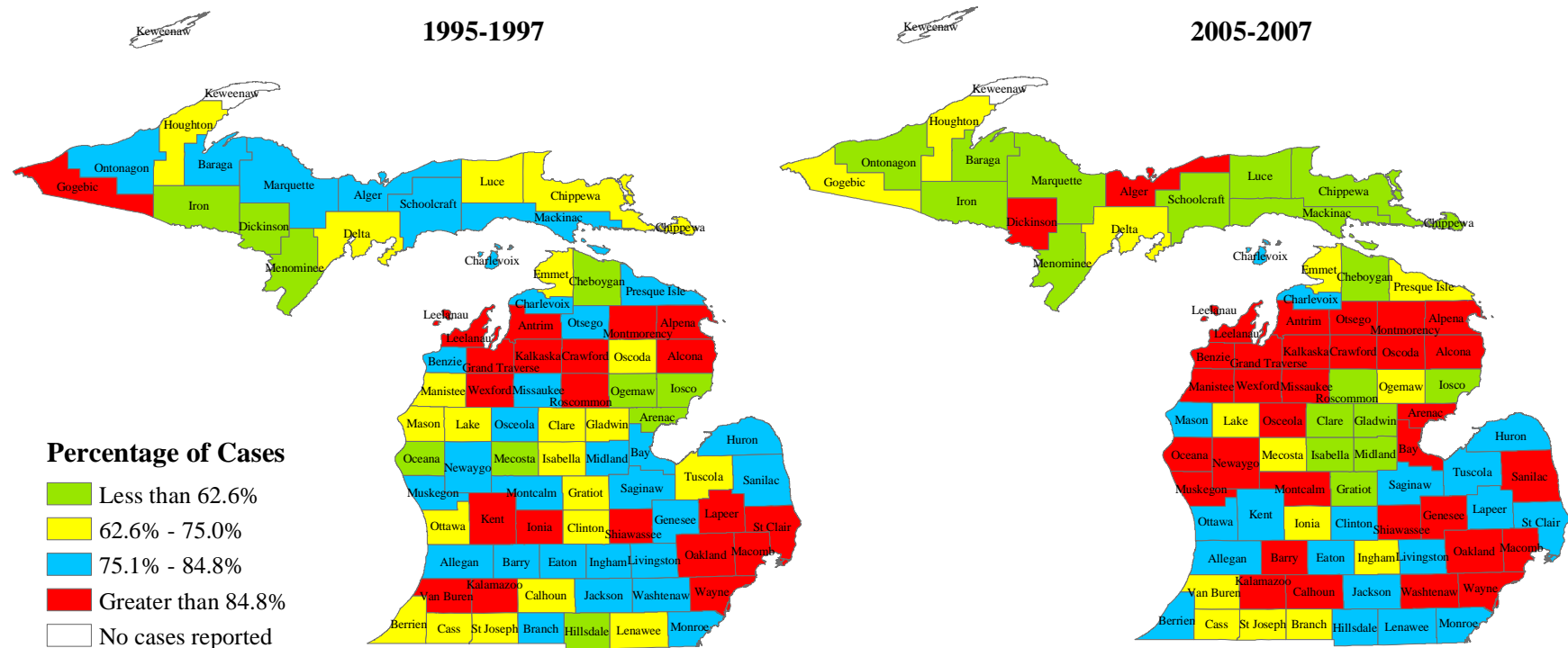
Table 18: Cervical Cancer Five-Year Relative Survival Rates by Stage at Diagnosis, Age and Race, US 2001-2007

| | All Races | White | Black |
|-------------------|------------------|--------------|--------------|
| All stages | 68.6 | 70.0 | 58.4 |
| Localized | 90.9 | 92.1 | 83.1 |
| Regional | 57.0 | 58.0 | 51.9 |
| Distant | 18.7 | 19.8 | 13.3 |
| Unknown | 53.7 | 53.0 | 51.9 |

Table 19: Numbers and Percentages of Invasive Cervical Cancer (Primary Site) by Stage at Diagnosis and Race, Michigan 2007

| | Total Number | Localized | | Regional | | Distant | | Unknown | |
|---------------|-------------------------|------------------|----------|-----------------|----------|----------------|----------|----------------|----------|
| | | Number | % | Number | % | Number | % | Number | % |
| Total | 412 | 198 | 48.1 | 140 | 33.9 | 34 | 8.3 | 40 | 9.7 |
| Whites | 322 | 158 | 49.1 | 110 | 34.2 | 22 | 6.8 | 32 | 9.9 |
| Blacks | 80 | 32 | 40.0 | 29 | 36.2 | 12 | 15.0 | 7 | 8.8 |

Figure 2: Percentage of Cervical Cancer Cases In-situ at Diagnosis by County



Colorectal Cancer

Table 20: Estimated Number of Colorectal Cancer Deaths and New Colorectal Cancer Cases, Michigan 2011

| | |
|-------------------|-------|
| Deaths | 1,670 |
| New Cases* | 4,800 |

*Excludes in situ carcinomas.

Note: Numbers are rounded to the nearest 10.

Table 21: Colorectal Cancer Mortality Rates by Gender and Race, Michigan 2008 vs. US 2007

| | Number in Michigan (2008) | Age-Adjusted Rate* | |
|----------------------|------------------------------|--------------------|----------------|
| | | Michigan (2008) | US-SEER (2007) |
| Total | 1,820 | 16.7 | 16.7 |
| All Males | 901 | 19.6 | 20.1 |
| White Males | 747 | 18.4 | 19.5 |
| Black Males | 135 | 29.4 | 29.1 |
| All Females | 919 | 14.4 | 14.2 |
| White Females | 769 | 13.7 | 13.7 |
| Black Females | 127 | 18.5 | 19.7 |

*Rate per 100,000 gender and race specific population.

Table 22: Colorectal Cancer Incidence Rates by Gender and Race, Michigan vs. US, 2007

| | Number in Michigan | Age-Adjusted Rate* | |
|----------------------|--------------------|--------------------|---------|
| | | Michigan | US-SEER |
| Total | 5,056 | 47.0 | 44.7 |
| All Males | 2,524 | 53.6 | 50.9 |
| White Males | 2,127 | 51.5 | 49.9 |
| Black Males | 329 | 66.7 | 60.8 |
| All Females | 2,531 | 41.9 | 39.6 |
| White Females | 2,109 | 40.1 | 38.7 |
| Black Females | 368 | 53.8 | 49.6 |

*Rate per 100,000 gender and race specific population.

Table 23: Age- and Gender-Specific Colorectal Cancer Mortality Rates, Michigan 2008

| Age (Years) | Total | | Males | | Females | |
|--------------------|--------|-------|--------|-------|---------|-------|
| | Number | Rate* | Number | Rate* | Number | Rate* |
| 20-29 | 7 | 0.5 | 2 | 0.3 | 5 | 0.8 |
| 30-39 | 20 | 1.6 | 16 | 2.5 | 4 | 0.6 |
| 40-49 | 96 | 6.4 | 51 | 6.9 | 45 | 6.0 |
| 50-59 | 238 | 16.9 | 133 | 19.2 | 105 | 14.7 |
| 60-69 | 322 | 35.5 | 189 | 43.5 | 133 | 28.2 |
| 70 and over | 1,137 | 124.1 | 510 | 137.8 | 627 | 114.8 |

*Rate per 100,000 age and gender-specific population.

Table 24: Age- and Gender-Specific Colorectal Cancer Incidence Rates, Michigan 2007

| Age (Years) | Total | | Males | | Females | |
|--------------------|--------|-------|--------|-------|---------|-------|
| | Number | Rate* | Number | Rate* | Number | Rate* |
| 20-29 | 18 | 1.3 | 7 | 1.0 | 11 | 1.7 |
| 30-39 | 72 | 5.6 | 43 | 6.6 | 29 | 4.5 |
| 40-49 | 382 | 24.9 | 191 | 25.1 | 191 | 24.8 |
| 50-59 | 932 | 67.3 | 495 | 72.7 | 437 | 62.1 |
| 60-69 | 1,077 | 124.2 | 594 | 143.0 | 483 | 106.8 |
| 70 and over | 2,571 | 281.4 | 1,193 | 324.7 | 1,377 | 252.1 |

*Rate per 100,000 age and gender-specific population.

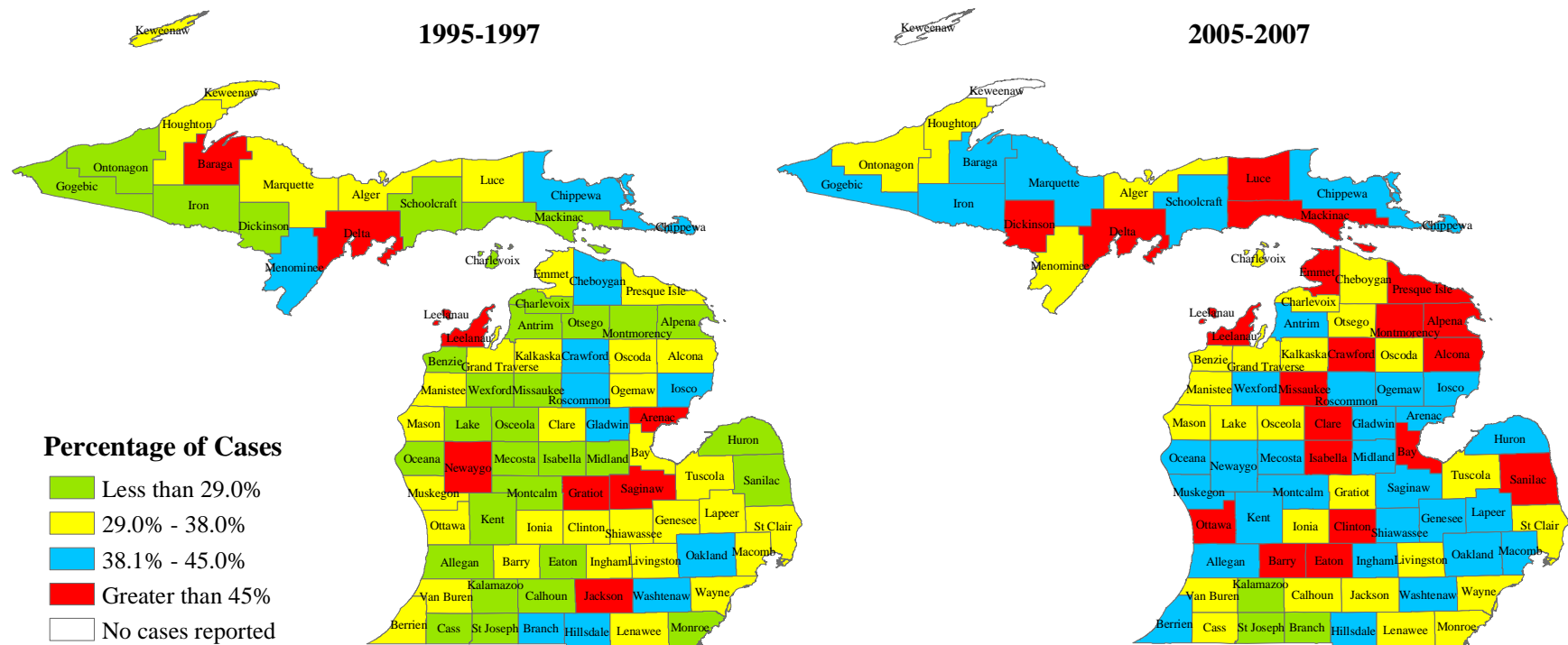
Table 25: Colorectal Cancer Five-Year Relative Survival Rates by Stage at Diagnosis, Race and Gender, US 2001-2007

| | All Races | | | White | | | Black | | |
|-------------------|------------|------|--------|------------|------|--------|------------|------|--------|
| | Both Sexes | Male | Female | Both Sexes | Male | Female | Both Sexes | Male | Female |
| All stages | 64.3 | 64.6 | 64.0 | 65.0 | 65.5 | 64.5 | 56.0 | 55.0 | 56.9 |
| Localized | 90.1 | 90.1 | 90.0 | 90.6 | 90.7 | 90.4 | 85.1 | 83.2 | 86.6 |
| Regional | 69.2 | 69.1 | 69.4 | 69.7 | 69.7 | 69.7 | 63.5 | 62.8 | 64.0 |
| Distant | 11.7 | 11.1 | 12.3 | 12.1 | 11.5 | 12.8 | 8.5 | 7.8 | 9.0 |
| Unknown | 33.3 | 36.8 | 30.3 | 31.4 | 35.0 | 28.3 | 33.8 | 35.1 | 32.6 |

Table 26: Numbers and Percentages of Invasive Colorectal Cancer (Primary Site) by Stage at Diagnosis and Race, Michigan 2007

| | Total Number | Localized | | Regional | | Distant | | Unknown | |
|---------------|--------------|-----------|------|----------|------|---------|------|---------|-----|
| | | Number | % | Number | % | Number | % | Number | % |
| Total | 5,056 | 2,058 | 40.7 | 1,646 | 32.6 | 890 | 17.6 | 462 | 9.1 |
| Whites | 4,237 | 1,734 | 40.9 | 1,412 | 33.3 | 695 | 16.4 | 396 | 9.4 |
| Blacks | 697 | 267 | 38.3 | 211 | 30.3 | 168 | 24.1 | 51 | 7.3 |

Figure 3: Percentage of Colorectal Cancer Cases Localized at Diagnosis by County



Lung Cancer

Table 27: Estimated Number of Lung Cancer Deaths and New Lung Cancer Cases, Michigan 2011

| | |
|-------------------|-------|
| Deaths | 5,830 |
| New Cases* | 8,140 |

*Excludes in situ carcinomas.

Note: Numbers are rounded to the nearest 10.

Table 28: Lung Cancer Mortality Rates by Gender and Race, Michigan 2008 vs. US 2007

| | Number in Michigan (2008) | Age-Adjusted Rate* | |
|----------------------|------------------------------|--------------------|----------------|
| | | Michigan (2008) | US-SEER (2007) |
| Total | 5,883 | 54.5 | 50.7 |
| All Males | 3,229 | 68.6 | 65.2 |
| White Males | 2,747 | 66.3 | 64.8 |
| Black Males | 430 | 88.8 | 82.8 |
| All Females | 2,654 | 44.2 | 40.0 |
| White Females | 2,298 | 44.0 | 41.1 |
| Black Females | 316 | 46.9 | 38.3 |

*Rate per 100,000 gender and race-specific population.

Table 29: Lung Cancer Incidence Rates by Gender and Race, Michigan vs. US, 2007

| | Number in Michigan | Age-Adjusted Rate* | |
|----------------------|--------------------|--------------------|---------|
| | | Michigan | US-SEER |
| Total | 7,712 | 72.4 | 59.3 |
| All Males | 4,023 | 85.9 | 69.9 |
| White Males | 3,454 | 83.8 | 69.1 |
| Black Males | 511 | 106.6 | 93.5 |
| All Females | 3,687 | 63.0 | 51.6 |
| White Females | 3,178 | 62.5 | 54.1 |
| Black Females | 459 | 68.0 | 53.4 |

*Rate per 100,000 gender and race-specific population.

Table 30: Age- and Gender-Specific Lung Cancer Mortality Rates, Michigan 2008

| | Total | | Males | | Females | |
|--------------------------|--------|-------|--------|-------|---------|-------|
| | Number | Rate* | Number | Rate* | Number | Rate* |
| 25-39 Years | 20 | 1.0 | 12 | 1.2 | 8 | 0.8 |
| 40-49 Years | 241 | 16.2 | 131 | 17.7 | 110 | 14.7 |
| 50-64 Years | 1,520 | 78.9 | 880 | 93.3 | 640 | 65.1 |
| 65 Years and Over | 4,100 | 314.3 | 2,204 | 397.9 | 1,896 | 252.6 |

*Rate per 100,000 age and gender-specific population.

Table 31: Age- and Gender-Specific Lung Cancer Incidence Rates, Michigan 2007

| | Total | | Males | | Females | |
|--------------------------|--------|-------|--------|-------|---------|-------|
| | Number | Rate* | Number | Rate* | Number | Rate* |
| 25-39 Years | 31 | 1.6 | 8 | 0.8 | 23 | 2.4 |
| 40-49 Years | 386 | 25.2 | 172 | 22.6 | 214 | 27.8 |
| 50-64 Years | 2,167 | 114.9 | 1,170 | 126.7 | 996 | 103.5 |
| 65 Years and Over | 5,122 | 400.1 | 2,670 | 494.1 | 2,451 | 331.3 |

*Rate per 100,000 age and gender-specific population.

Table 32: Lung Cancer Five-Year Relative Survival Rates by Stage at Diagnosis, Race and Gender, US 2001-2007

| | All Races | | | Whites | | | Blacks | | |
|-------------------|------------|-------|---------|------------|-------|---------|------------|-------|---------|
| | Both Sexes | Males | Females | Both Sexes | Males | Females | Both Sexes | Males | Females |
| All stages | 15.6 | 13.5 | 18.0 | 15.9 | 13.7 | 18.3 | 12.9 | 11.6 | 14.5 |
| Localized | 52.0 | 47.2 | 56.5 | 52.7 | 48.0 | 57.0 | 43.7 | 39.5 | 48.3 |
| Regional | 24.2 | 22.0 | 26.9 | 24.2 | 24.0 | 26.8 | 22.4 | 21.2 | 24.0 |
| Distant | 3.6 | 3.0 | 4.2 | 3.5 | 2.9 | 4.1 | 3.4 | 3.3 | 3.6 |
| Unknown | 8.1 | 7.1 | 9.2 | 7.7 | 6.5 | 8.9 | 10.3 | 9.8 | 11.0 |

Table 33: Numbers and Percentages of Invasive Lung Cancer Cases (Primary Site) by Stage at Diagnosis and Race, Michigan 2007

| | Total Number | Localized | | Regional | | Distant | | Unknown | |
|---------------|--------------|-----------|------|----------|------|---------|------|---------|------|
| | | Number | % | Number | % | Number | % | Number | % |
| Total | 7,712 | 1,426 | 18.5 | 1,741 | 22.5 | 3,785 | 49.1 | 760 | 9.9 |
| Whites | 6,633 | 1,262 | 19.0 | 1,496 | 22.6 | 3,171 | 47.8 | 704 | 10.6 |
| Blacks | 970 | 146 | 15.1 | 217 | 22.4 | 562 | 57.9 | 45 | 4.6 |

Prostate Cancer

Table 34: Estimated Number of Prostate Cancer Deaths and New Prostate Cancer Cases, Michigan 2011

| | |
|-------------------|-------|
| Deaths | 1,150 |
| New Cases* | 8,940 |

*Excludes in situ carcinomas.

Note: Numbers are rounded to the nearest 10.

Table 35: Prostate Cancer Mortality Rates by Race, Michigan 2008 vs. US 2007

| | Number in Michigan (2008) | Age-Adjusted Rate* | |
|---------------|--------------------------------------|---------------------------|-----------------------|
| | | Michigan (2008) | US-SEER (2007) |
| Total | 922 | 21.9 | 23.5 |
| Whites | 742 | 19.8 | 21.6 |
| Blacks | 170 | 42.6 | 52.0 |

*Rate per 100,000 race and gender-specific population.

Table 36: Prostate Cancer Incidence Rates by Race, Michigan vs. US 2007

| | Number in Michigan | Age-Adjusted Rate* | |
|---------------|-------------------------------|---------------------------|----------------|
| | | Michigan | US-SEER |
| Total | 8,345 | 168.7 | 165.8 |
| Whites | 6,552 | 150.5 | 159.3 |
| Blacks | 1,136 | 227.1 | 241.2 |

*Rate per 100,000 race and gender-specific population.

Table 37: Age- and Race-Specific Prostate Cancer Mortality Rates, Michigan 2008

| Age (Years) | Total (All Races) | | White | | Black | |
|---------------------|-------------------|-------|--------|-------|--------|-------|
| | Number | Rate* | Number | Rate* | Number | Rate* |
| 25-39 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| 40-49 | 1 | 0.1 | 0 | 0.0 | 1 | 1.1 |
| 50-64 | 85 | 9.0 | 57 | 7.0 | 27 | 26.0 |
| 65 and Older | 836 | 150.9 | 685 | 138.5 | 142 | 285.1 |

*Rate per 100,000 age, gender, and race-specific population.

Table 38: Age- and Race-Specific Prostate Cancer Incidence Rates, Michigan 2007

| Age (Years) | Total (All Races) | | White | | Black | |
|---------------------|-------------------|-------|--------|-------|--------|--------|
| | Number | Rate* | Number | Rate* | Number | Rate* |
| 25-39 | 6 | 0.6 | 3 | 0.4 | 2 | 1.3 |
| 40-49 | 284 | 37.3 | 180 | 28.0 | 81 | 86.9 |
| 50-64 | 3,307 | 358.2 | 2,548 | 318.3 | 510 | 501.8 |
| 65 and Older | 4,747 | 878.5 | 3,820 | 791.9 | 543 | 1107.7 |

*Rate per 100,000 age, gender, and race-specific population.

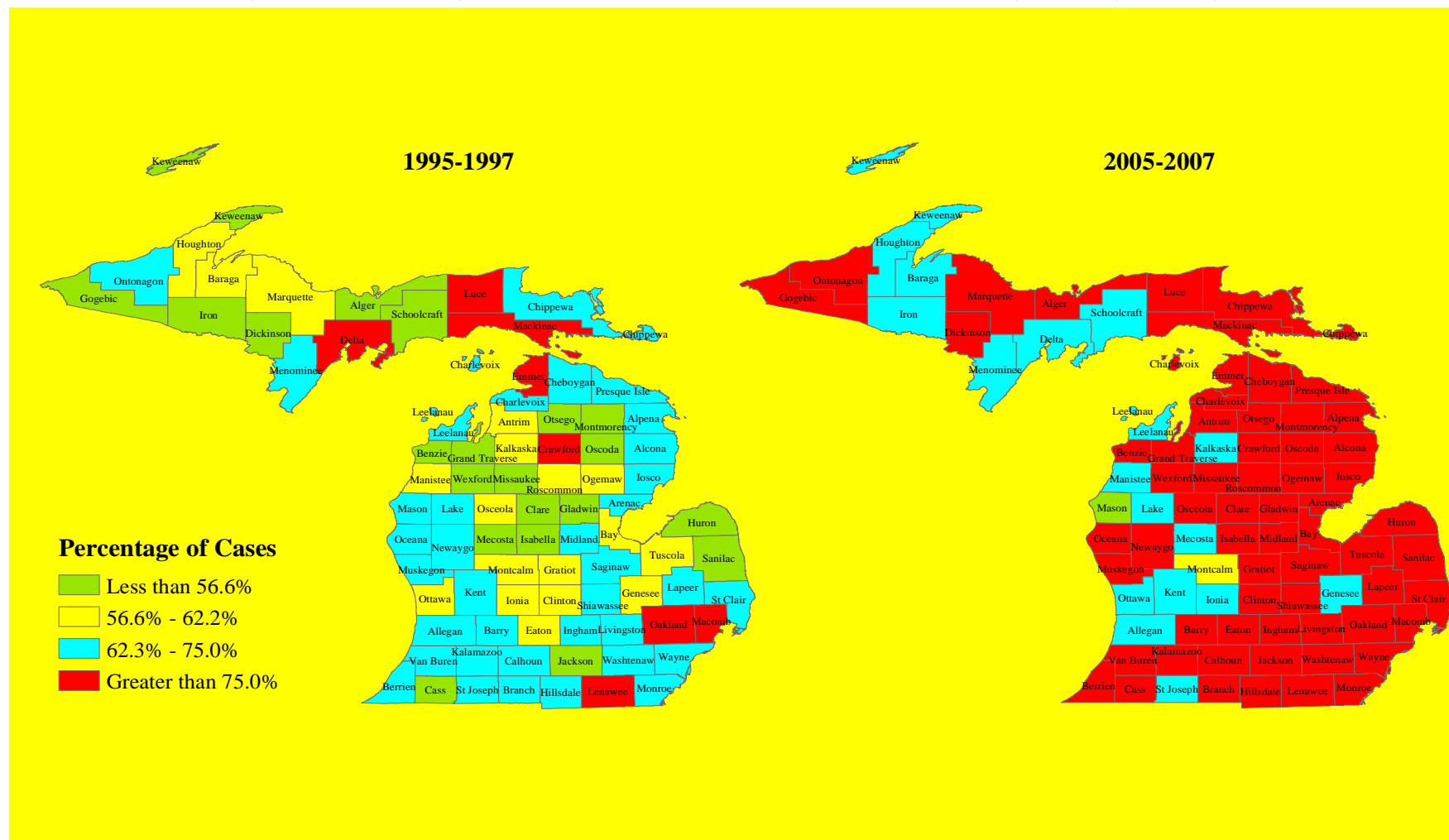
Table 39: Prostate Cancer Five-Year Relative Survival Rates by Stage at Diagnosis and Race, US 2001-2007

| | All Races | White | Black |
|-------------------|-----------|-------|-------|
| All stages | 99.4 | 99.7 | 96.2 |
| Localized | 100.0 | 100.0 | 100.0 |
| Regional | 100.0 | 100.0 | 100.0 |
| Distant | 28.8 | 28.2 | 28.2 |
| Unknown | 69.9 | 68.8 | 58.8 |

Table 40: Numbers and Percentages of Invasive Prostate Cancer (Primary Site) by Stage at Diagnosis and Race, Michigan 2007

| | Total Number | Localized | | Regional | | Distant | | Unknown | |
|---------------|-----------------|-----------|------|----------|------|---------|-----|---------|-----|
| | | Number | % | Number | % | Number | % | Number | % |
| Total | 8,345 | 6,897 | 82.7 | 754 | 9.0 | 200 | 2.4 | 494 | 5.9 |
| Whites | 6,552 | 5,395 | 82.3 | 589 | 9.0 | 142 | 2.2 | 426 | 6.5 |
| Blacks | 1,136 | 925 | 81.4 | 118 | 10.4 | 57 | 5.0 | 36 | 3.2 |

Figure 4: Percentage of Prostate Cancer Cases Localized at Diagnosis by County



Ovarian Cancer

Table 41: Estimated Number of Ovarian Cancer Deaths, Michigan 2011

| | |
|---------------|-----|
| Deaths | 560 |
|---------------|-----|

Note: Numbers are rounded to the nearest 10.

Table 42: Ovarian Cancer Mortality Rates by Race, Michigan 2008 vs. US 2007

| | Number in Michigan (2008) | Age-Adjusted Rate* | |
|---------------|------------------------------|--------------------|----------------|
| | | Michigan (2008) | US-SEER (2007) |
| Total | 479 | 8.0 | 8.2 |
| Whites | 433 | 8.3 | 8.6 |
| Blacks | 41 | 6.0 | 6.6 |

*Rate per 100,000 race and gender-specific population.

Table 43: Ovarian Cancer Incidence Rates by Race, Michigan vs. US 2007

| | Number in Michigan | Age-Adjusted Rate* | |
|---------------|-----------------------|--------------------|---------|
| | | Michigan | US-SEER |
| Total | 759 | 13.2 | 12.5 |
| Whites | 662 | 13.4 | 13.0 |
| Blacks | 83 | 11.8 | 11.0 |

*Rate per 100,000 race and gender-specific population.

Table 44: Age- and Race-Specific Ovarian Cancer Mortality Rates, Michigan 2008

| Age (Years) | Total (All Races) | | White | | Black | |
|---------------------|-------------------|-------|--------|-------|--------|-------|
| | Number | Rate* | Number | Rate* | Number | Rate* |
| 25-39 | 7 | 0.7 | 6 | 0.8 | 1 | 0.6 |
| 40-49 | 32 | 4.3 | 26 | 4.2 | 6 | 5.6 |
| 50-64 | 122 | 12.4 | 111 | 13.4 | 10 | 7.8 |
| 65 and Older | 316 | 42.1 | 288 | 43.5 | 24 | 30.9 |

*Rate per 100,000 age, gender, and race-specific population.

Table 45: Age- and Race-Specific Female Ovarian Cancer Incidence Rates, Michigan 2007

| Age (Years) | Total (All Races) | | White | | Black | |
|---------------------|-------------------|-------|--------|-------|--------|-------|
| | Number | Rate* | Number | Rate* | Number | Rate* |
| 25-39 | 42 | 4.3 | 34 | 4.5 | 5 | 3.0 |
| 40-49 | 97 | 12.6 | 79 | 12.4 | 15 | 13.8 |
| 50-64 | 257 | 26.7 | 232 | 28.5 | 23 | 18.4 |
| 65 and Older | 347 | 46.9 | 308 | 47.2 | 33 | 43.1 |

*Rate per 100,000 age, gender, and race-specific population.

Table 46: Ovarian Cancer Five-Year Relative Survival Rates by Stage at Diagnosis and Race, US 2001-2007

| | All Races | White | Black |
|-------------------|------------------|--------------|--------------|
| All stages | 43.8 | 43.7 | 34.9 |
| Localized | 92.4 | 92.4 | 89.1 |
| Regional | 71.7 | 72.8 | 57.2 |
| Distant | 27.2 | 27.7 | 18.9 |
| Unknown | 22.4 | 21.1 | 25.6 |

Table 47: Numbers and Percentages of Ovarian Cancer (Primary Site) by Stage at Diagnosis and Race, Michigan 2007

| | Total Number | Localized | | Regional | | Distant | | Unknown | |
|---------------|-------------------------|------------------|----------|-----------------|----------|----------------|----------|----------------|----------|
| | | Number | % | Number | % | Number | % | Number | % |
| Total | 759 | 136 | 17.9 | 151 | 19.9 | 401 | 52.8 | 71 | 9.4 |
| Whites | 662 | 113 | 17.1 | 136 | 20.5 | 354 | 53.5 | 59 | 8.9 |
| Blacks | 83 | 18 | 21.7 | 13 | 15.7 | 41 | 49.4 | 11 | 13.2 |

Time Trends

Table of Contents

| | |
|--|-----------|
| Background | 2 |
| Summary..... | 2 |
| Mortality | 4 |
| Figure 1: Estimated Annual Percent Change in Mortality Rates by Cancer Site, Michigan 1999-2008.. | 4 |
| Figure 2: Estimated Annual Percent Change in Mortality Rates by Cancer Site, Michigan Females 1999-2008..... | 5 |
| Figure 3: Estimated Annual Percent Change in Mortality Rates by Cancer Site, Michigan Males 1999-2008..... | 6 |
| Figure 4: Estimated Annual Percent Change in Mortality Rates, Michigan vs. US 1998-2007 | 7 |
| Figure 5: Total Mortality Rates by Cancer Site, Michigan 1994-2008 | 8 |
| Figure 6: Female Mortality Rates by Cancer Site, Michigan 1994-2008..... | 9 |
| Figure 7: Male Mortality Rates by Cancer Site, Michigan 1994-2008 | 10 |
| Incidence | 11 |
| Figure 8: Estimated Annual Percent Change in Incidence Rates by Cancer Site, Michigan 1998-2007 | 11 |
| Figure 9: Estimated Annual Percent Change in Incidence Rates by Cancer Site, Michigan Females 1998-2007..... | 12 |
| Figure 10: Estimated Annual Percent Change in Incidence Rates by Cancer Site, Michigan Males 1998-2007..... | 13 |
| Figure 11: Estimated Annual Percent Change in Incidence Rates, Michigan vs. US 1998-2007 | 14 |
| Figure 12: Total Incidence Rates by Cancer Site, Michigan 1993-2007..... | 15 |
| Figure 13: Female Incidence Rates by Cancer Site, Michigan 1993-2007 | 16 |
| Figure 14: Male Incidence Rates by Cancer Site, Michigan 1993-2007..... | 17 |

Background

Changes that occurred in cancer incidence and cancer mortality in Michigan over a ten to fifteen-year period are illustrated in this section. Data on new cancer cases from 1993 to 2007 and deaths due to cancer from 1994 to 2008 were made available from the Michigan Cancer Surveillance Program at the Michigan Department of Community Health.^{1,2} The Estimated Annual Percent Change (EAPC) in age-adjusted incidence and mortality rates over multiple-year periods were calculated by regressing the calendar year on the natural log of age-adjusted incidence and mortality rates.^{3,4} Rates were calculated by direct age-adjustment using the 2000 US population age distribution as the standard population. In the regression equation ($y=mx+b$), x =year and $y=\ln(\text{rate})$. The $\text{EAPC}=100*((e^m)-1)$. To test EAPC for statistical significance, t tests were used to test the hypothesis that the slope of the regression line is equal to zero, using two-sided $p=.05$. The EAPC in mortality rates was calculated over the period 1999 to 2008 and EAPC in incidence rates was calculated over the period 1998 to 2007. In order to compare Michigan with the United States, the EAPC in mortality rates was calculated over the period 1998 to 2007.⁵

Summary

Figures 1 through 3 show the EAPC in mortality rates for the total population, and for women and men for the relevant cancer sites. From 1999 to 2008, total mortality rates in Michigan due to breast, cervical, colorectal, lung, prostate, and ovarian cancer all decreased. All changes were statistically significant at $p \leq .05$, except for cervical cancer. Lung cancer mortality rates decreased among men, but increased among women (statistically significant changes at $p \leq .05$).

Figure 4 shows EAPC in mortality rates for Michigan compared to the United States from 1998 to 2007. The estimated annual percent change in Michigan decreased at a greater rate than the United States among prostate cancer mortality rates and among for cervical cancer mortality rates. The annual percent change in mortality rates for lung cancer decreased at a smaller rate in Michigan compared to the United States. The annual percent change in mortality rates for colorectal, breast, and ovarian cancer were comparable between Michigan and the United States.

Figures 5 through 7 follow the yearly mortality rates for each cancer site from 1994 to 2008 for the total population, and women and men separately. Overall, mortality rates for each cancer site

¹ Michigan Cancer Surveillance Program. (2010). *Michigan Cancer Death Public Use File 1985-2008*. Michigan Department of Community Health (MDCH), Division for Vital Records & Health Statistics.

² Michigan Cancer Surveillance Program. (2010). *Michigan Cancer Incidence Public Use File 1985-2007*. Michigan Department of Community Health (MDCH), Division for Vital Records & Health Statistics.

³ Rates were calculated using annual state population estimates based on the actual size of the Michigan population in years 1985 through 2007. Population data is provided by the Michigan Department of Community Health, Division for Vital Records and Statistics.

⁴ Edwards BK, Brown ML, Wingo PA, Howe HL, Ward I, Ries LAG, Schrag D, Jamison PM, Jemal A, Wu XC, Friedman C, Harlan L, Warren J, Anderson RN, Pickle LW. (2005). Annual Report to the Nation on the Status of Cancer, 1975-2002, Featuring Population-Based Trends in Cancer Treatment. *Journal of the National Cancer Institute*. 97:19, 1407-27.

⁵ National Cancer Institute. (2010). *SEER Cancer Statistics Review, 1975-2007*. Retrieved from: www.seer.cancer.gov/csr/1975_2007/index.html

have decreased. Prostate cancer has seen the greatest decrease in mortality over the fifteen year period, while ovarian cancer mortality rates have remained fairly stable. Lung cancer mortality rates among females in Michigan have increased, while colorectal and breast cancer mortality rates have declined among Michigan women. Mortality rates for lung, colorectal, and prostate cancer have declined among Michigan men.

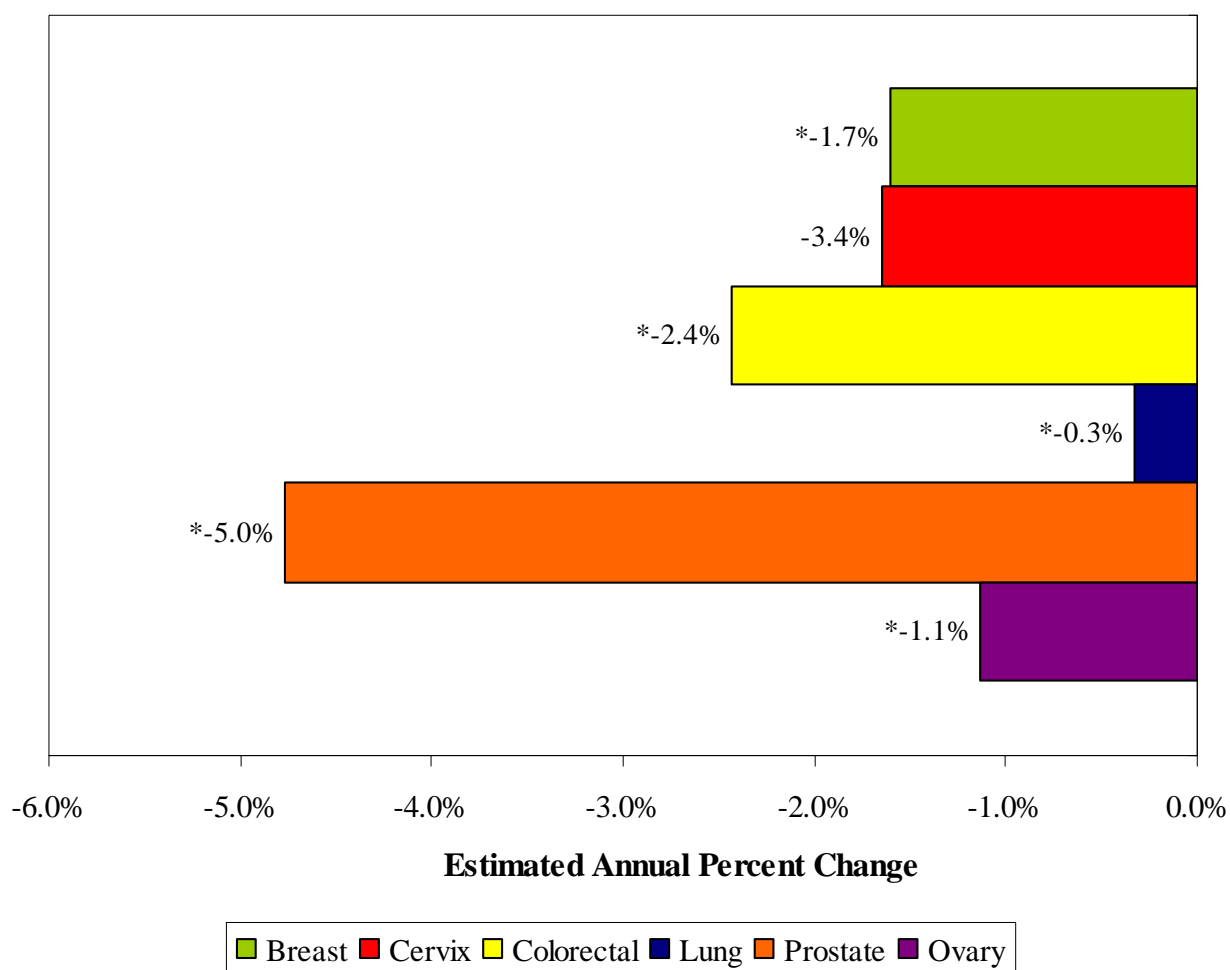
Figures 8 through 10 show the EAPC in cancer incidence rates between 1998 and 2007 for the state's population as a whole, as well as for Michigan women and men separately. As can be seen, the incidence rates for breast, cervical, colorectal, ovarian, and prostate cancer decreased significantly ($p < 0.05$) among the state's total population, while the incidence rate for lung cancer decreased only slightly. When considered separately, the rates for Michigan women showed significant ($p < 0.05$) decreases in breast, cervical, colorectal, and ovarian cancer incidence, but a 0.8% increase in lung cancer incidence. Rates for Michigan men, meanwhile, showed significant ($p < 0.05$) decreases in colorectal, lung and prostate cancer incidence.

Figure 11 shows EAPC in incidence rates for Michigan compared to the United States from 1998 to 2007. The estimated annual percent change in incidence rates between Michigan and the United States for colorectal cancer and breast cancer are comparable. The estimated annual percent change in incidence rates decreased per year at a greater rate in Michigan than the United States for prostate and ovarian cancer. The estimated annual percent change in lung and cervical cancer incidence rates decreased at a smaller rate in Michigan than in the United States.

Figures 12 through 14 follow the yearly incidence rates by cancer site from 1993 to 2007 for the total population, and women and men separately. Overall, incidence rates have declined for each cancer site. Among Michigan females, the incidence rate for lung cancer has increased from 57.2 cases per 100,000 women in 1993 to 63.0 cases per 100,000 in 2007. Among Michigan males, overall incidence rates for colorectal, lung and prostate cancer have all declined from 1993 to 2007, with the greatest decrease in incidence seen within prostate cancer.

Mortality

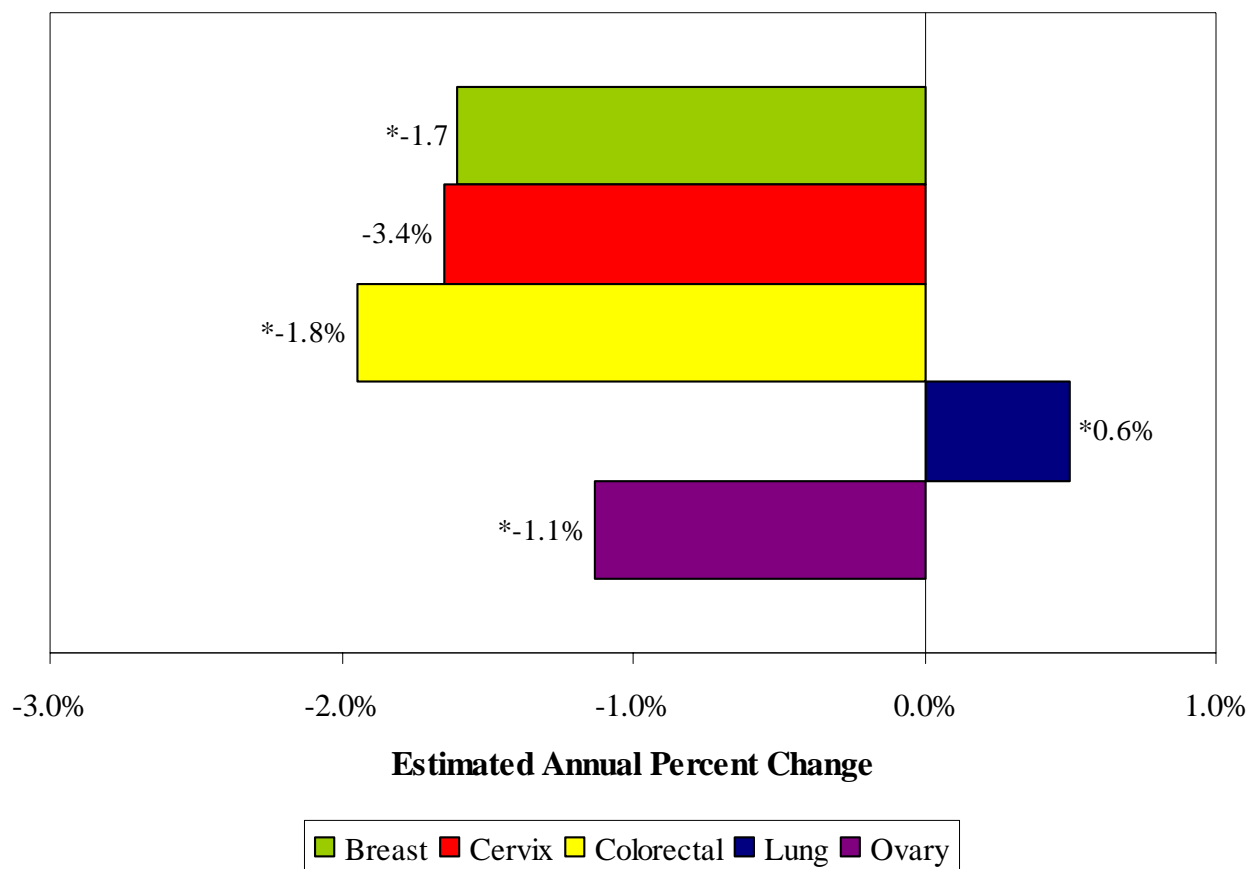
Figure 1: Estimated Annual Percent Change in Mortality Rates by Cancer Site, Michigan 1999-2008



* The EAPC is significantly different from zero ($p \leq .05$).

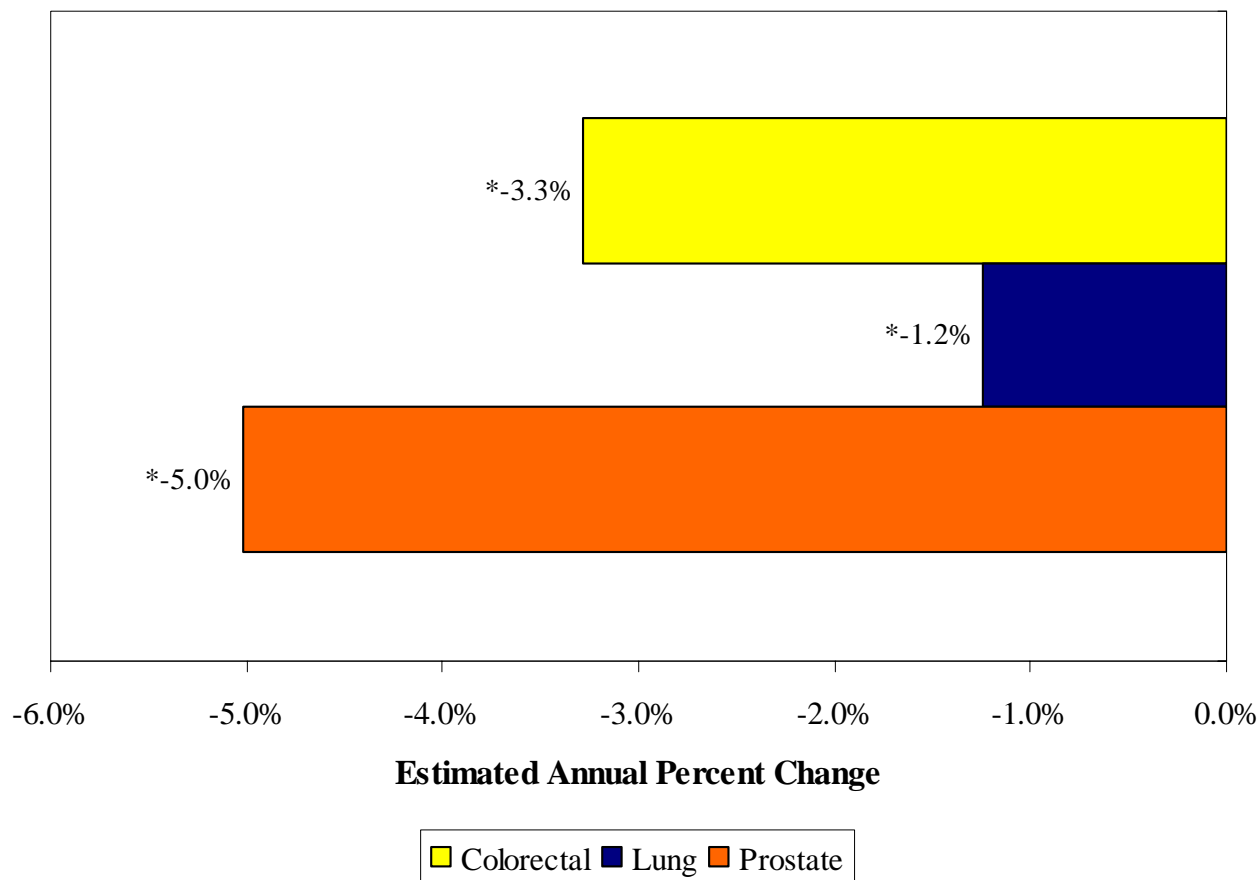
Rates are age-adjusted and computed by gender for breast, cervical and prostate cancer.

Figure 2: Estimated Annual Percent Change in Mortality Rates by Cancer Site, Michigan Females 1999-2008



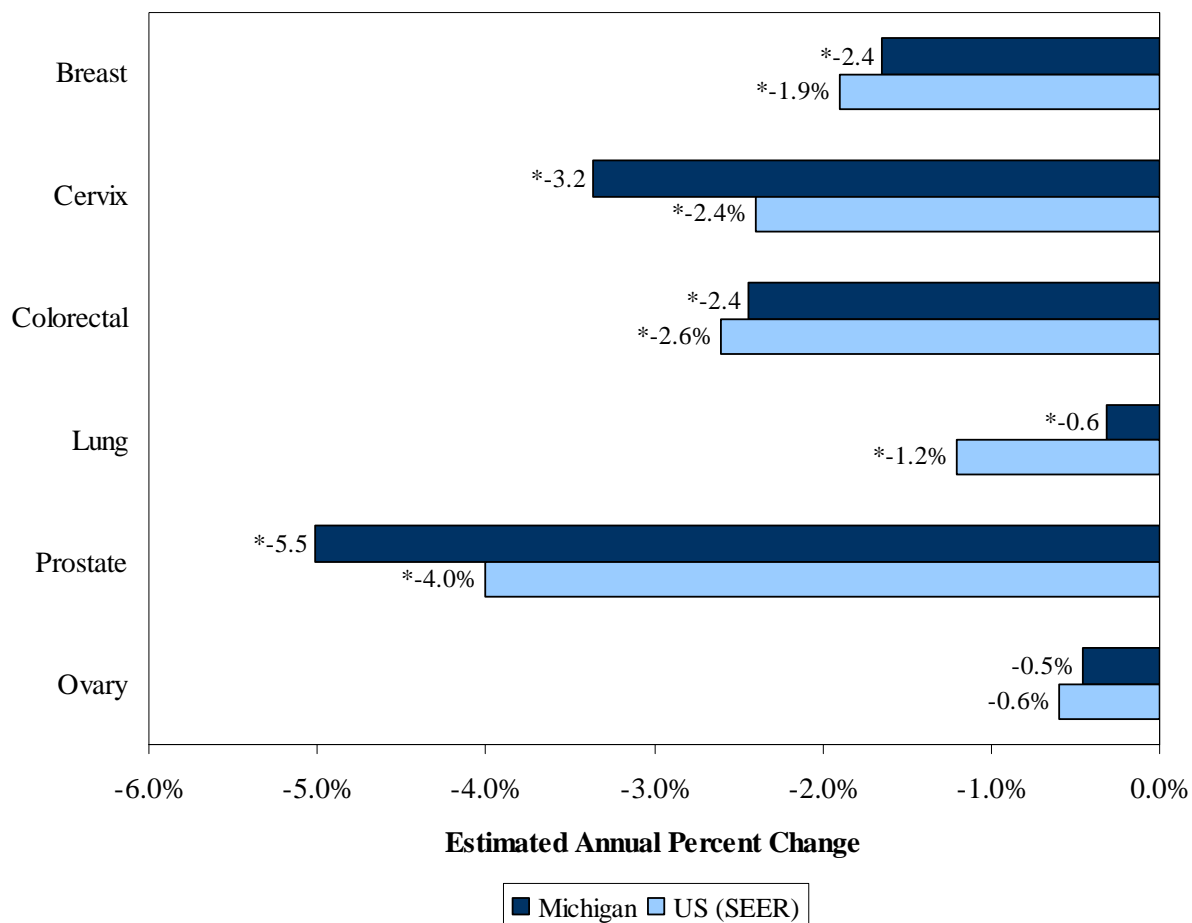
* The EAPC is significantly different from zero ($p \leq .05$).
Rates are age-adjusted and computed by gender.

Figure 3: Estimated Annual Percent Change in Mortality Rates by Cancer Site,
Michigan Males 1999-2008



* The EAPC is significantly different from zero ($p \leq .05$).
Rates are age-adjusted and computed by gender.

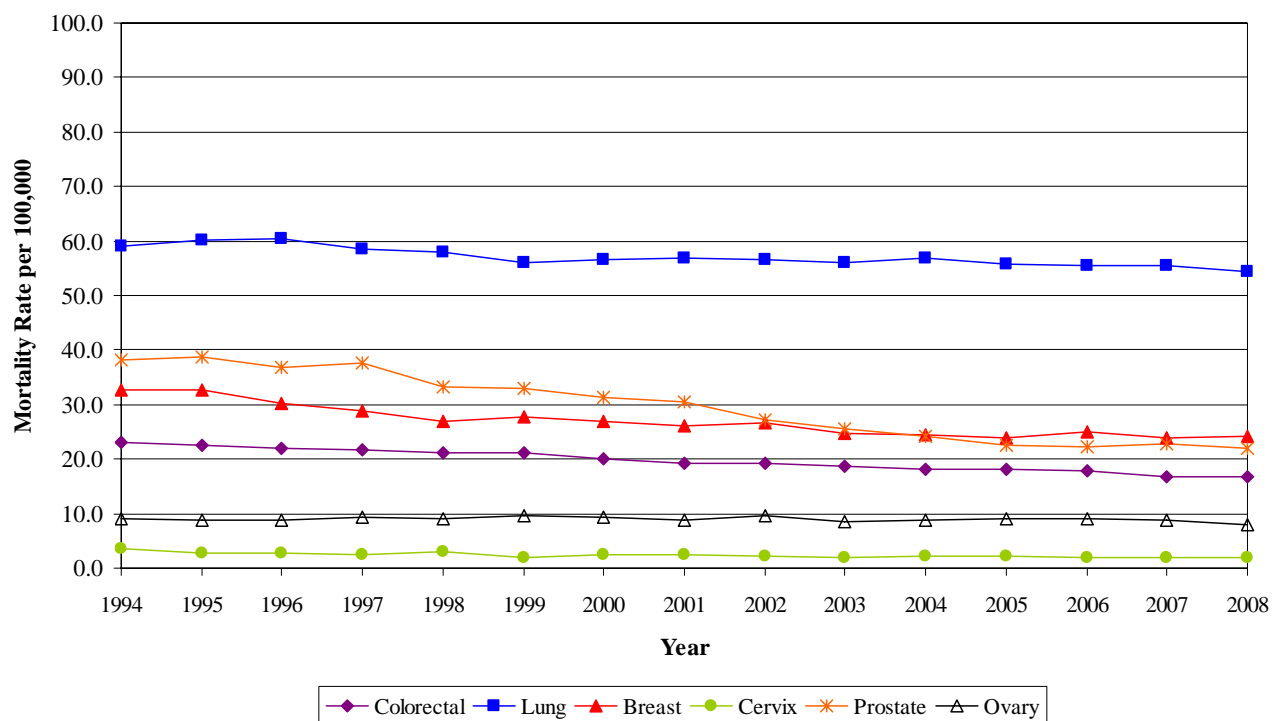
Figure 4: Estimated Annual Percent Change in Mortality Rates, Michigan vs. US
1998-2007



* The EAPC is significantly different from zero ($p \leq .05$).

Rates are age-adjusted and computed by gender breast, cervical and prostate cancer.

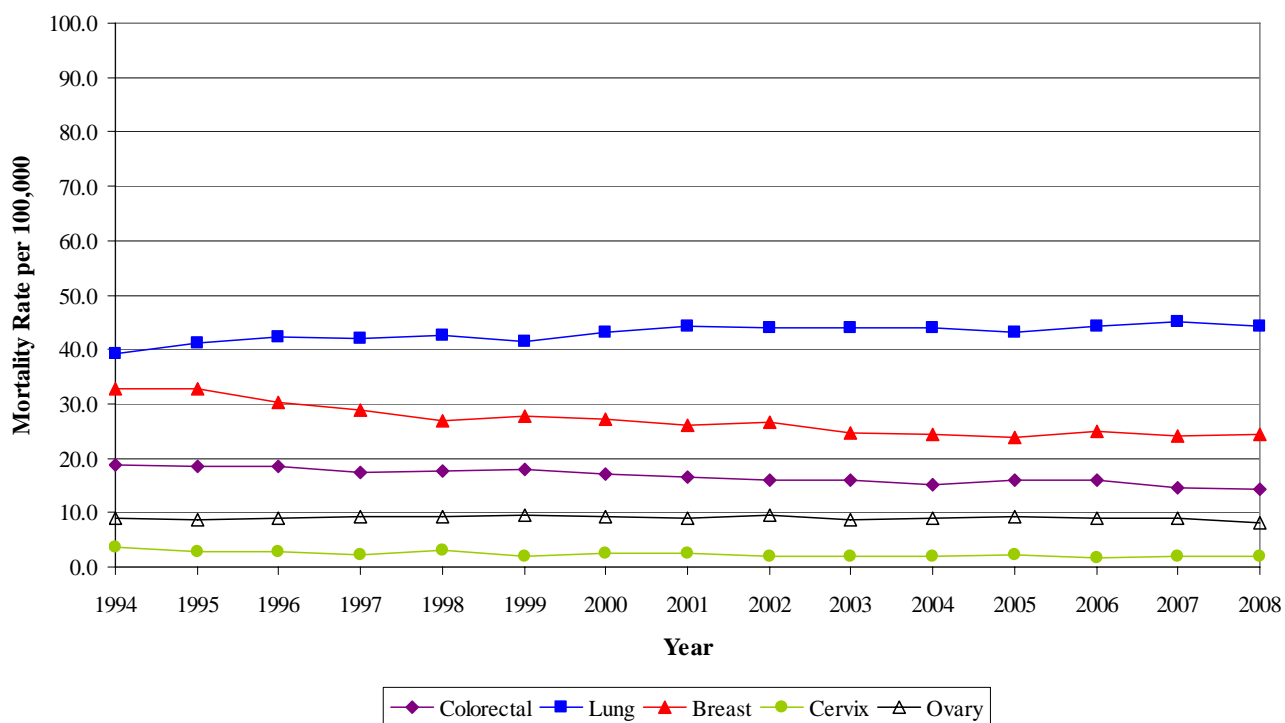
Figure 5: Total Mortality Rates by Cancer Site, Michigan 1994-2008



| | Colorectal | Lung | Breast | Cervix | Prostate | Ovary |
|------|------------|------|--------|--------|----------|-------|
| 1994 | 23.0 | 58.9 | 32.7 | 3.7 | 38.2 | 9.1 |
| 1995 | 22.6 | 60.2 | 32.8 | 2.8 | 38.6 | 8.7 |
| 1996 | 22.1 | 60.4 | 30.3 | 2.9 | 36.7 | 8.9 |
| 1997 | 21.6 | 58.5 | 28.9 | 2.4 | 37.5 | 9.4 |
| 1998 | 21.2 | 57.9 | 27.0 | 3.0 | 33.3 | 9.1 |
| 1999 | 21.3 | 56.1 | 27.8 | 2.1 | 33.0 | 9.6 |
| 2000 | 20.2 | 56.6 | 27.1 | 2.4 | 31.3 | 9.3 |
| 2001 | 19.2 | 56.9 | 26.2 | 2.5 | 30.5 | 8.8 |
| 2002 | 19.2 | 56.6 | 26.7 | 2.1 | 27.2 | 9.6 |
| 2003 | 18.8 | 56.1 | 24.7 | 1.9 | 25.5 | 8.6 |
| 2004 | 18.0 | 56.8 | 24.3 | 2.1 | 24.3 | 8.8 |
| 2005 | 18.2 | 55.9 | 23.8 | 2.2 | 22.7 | 9.2 |
| 2006 | 17.8 | 55.6 | 24.9 | 1.8 | 22.3 | 9.1 |
| 2007 | 16.8 | 55.5 | 24.0 | 2.0 | 22.9 | 8.9 |
| 2008 | 16.7 | 54.5 | 24.2 | 2.0 | 21.9 | 8.0 |

-Rates are age-adjusted per 100,000 gender-specific population.

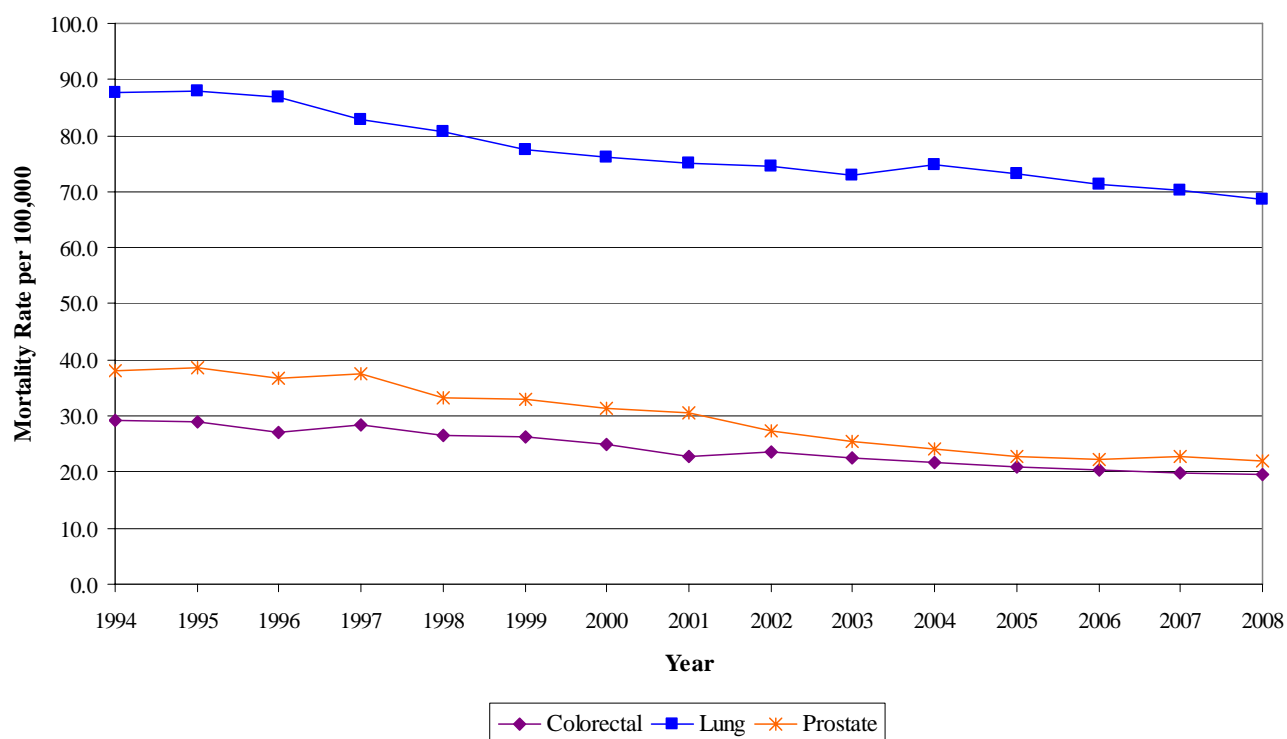
Figure 6: Female Mortality Rates by Cancer Site, Michigan 1994-2008



| | Colorectal | Lung | Breast | Cervix | Ovary |
|------|------------|------|--------|--------|-------|
| 1994 | 18.9 | 39.2 | 32.7 | 3.7 | 9.1 |
| 1995 | 18.5 | 41.3 | 32.8 | 2.8 | 8.7 |
| 1996 | 18.6 | 42.4 | 30.3 | 2.9 | 8.9 |
| 1997 | 17.3 | 42.1 | 28.9 | 2.4 | 9.4 |
| 1998 | 17.5 | 42.5 | 27.0 | 3.0 | 9.1 |
| 1999 | 17.8 | 41.5 | 27.8 | 2.1 | 9.6 |
| 2000 | 17.0 | 43.1 | 27.1 | 2.4 | 9.3 |
| 2001 | 16.6 | 44.3 | 26.2 | 2.5 | 8.8 |
| 2002 | 16.0 | 44.1 | 26.7 | 2.1 | 9.6 |
| 2003 | 16.0 | 43.9 | 24.7 | 1.9 | 8.6 |
| 2004 | 15.2 | 44.0 | 24.3 | 2.1 | 8.8 |
| 2005 | 15.9 | 43.1 | 23.8 | 2.2 | 9.2 |
| 2006 | 15.9 | 44.2 | 24.9 | 1.8 | 9.1 |
| 2007 | 14.7 | 45.0 | 24.0 | 2.0 | 8.9 |
| 2008 | 14.4 | 44.2 | 24.2 | 2.0 | 8.0 |

-Rates are age-adjusted per 100,000 gender-specific population.

Figure 7: Male Mortality Rates by Cancer Site, Michigan 1994-2008

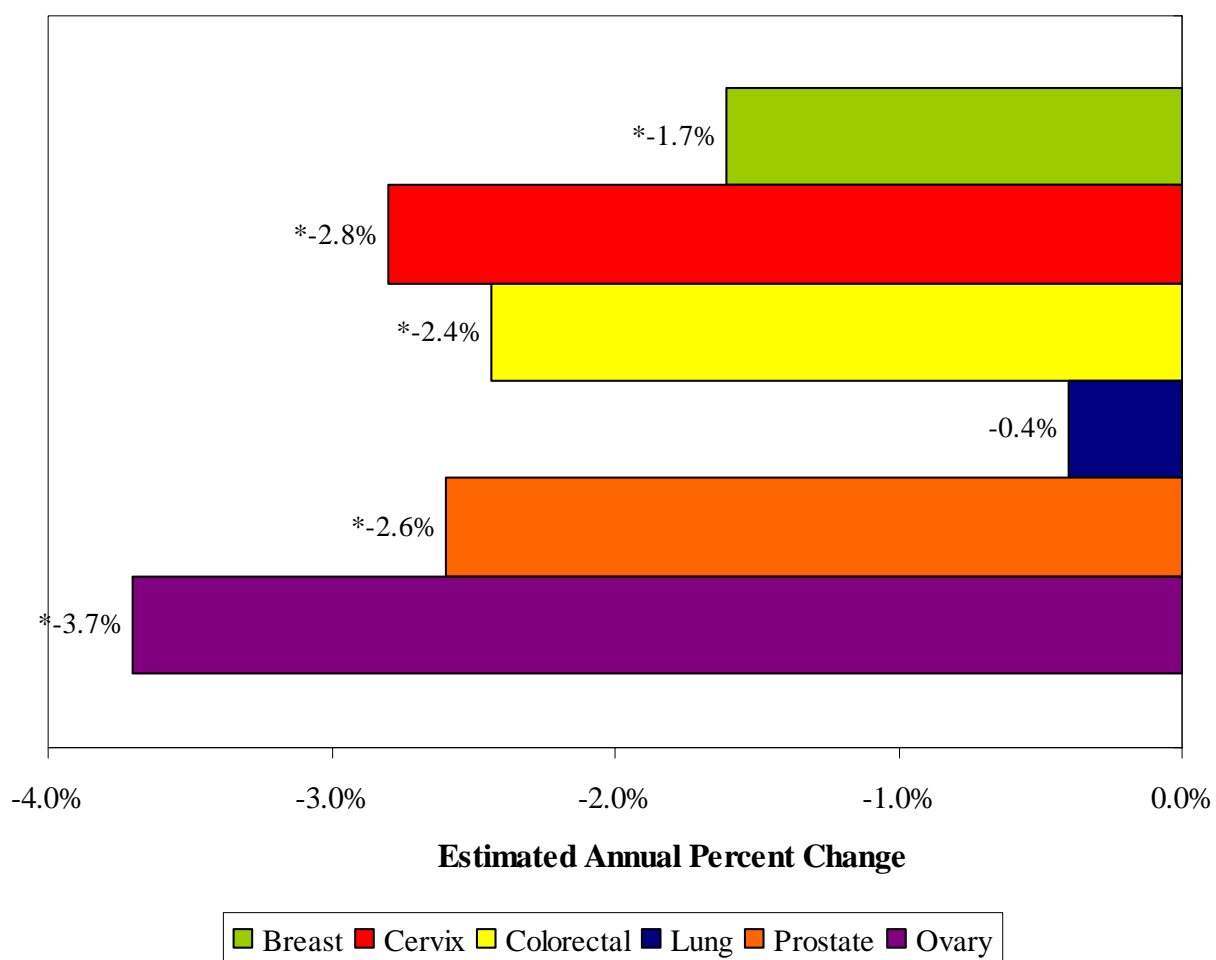


| | Colorectal | Lung | Prostate |
|------|------------|------|----------|
| 1994 | 29.2 | 87.6 | 38.2 |
| 1995 | 29.0 | 88.0 | 38.6 |
| 1996 | 27.2 | 86.7 | 36.7 |
| 1997 | 28.3 | 82.9 | 37.5 |
| 1998 | 26.5 | 80.6 | 33.3 |
| 1999 | 26.4 | 77.6 | 33.0 |
| 2000 | 25.1 | 76.1 | 31.3 |
| 2001 | 22.9 | 75.1 | 30.5 |
| 2002 | 23.6 | 74.6 | 27.2 |
| 2003 | 22.5 | 72.9 | 25.5 |
| 2004 | 21.8 | 74.8 | 24.3 |
| 2005 | 21.0 | 73.1 | 22.7 |
| 2006 | 20.4 | 71.2 | 22.3 |
| 2007 | 19.8 | 70.3 | 22.9 |
| 2008 | 19.6 | 68.6 | 21.9 |

-Rates are age-adjusted per 100,000 gender-specific population.

Incidence

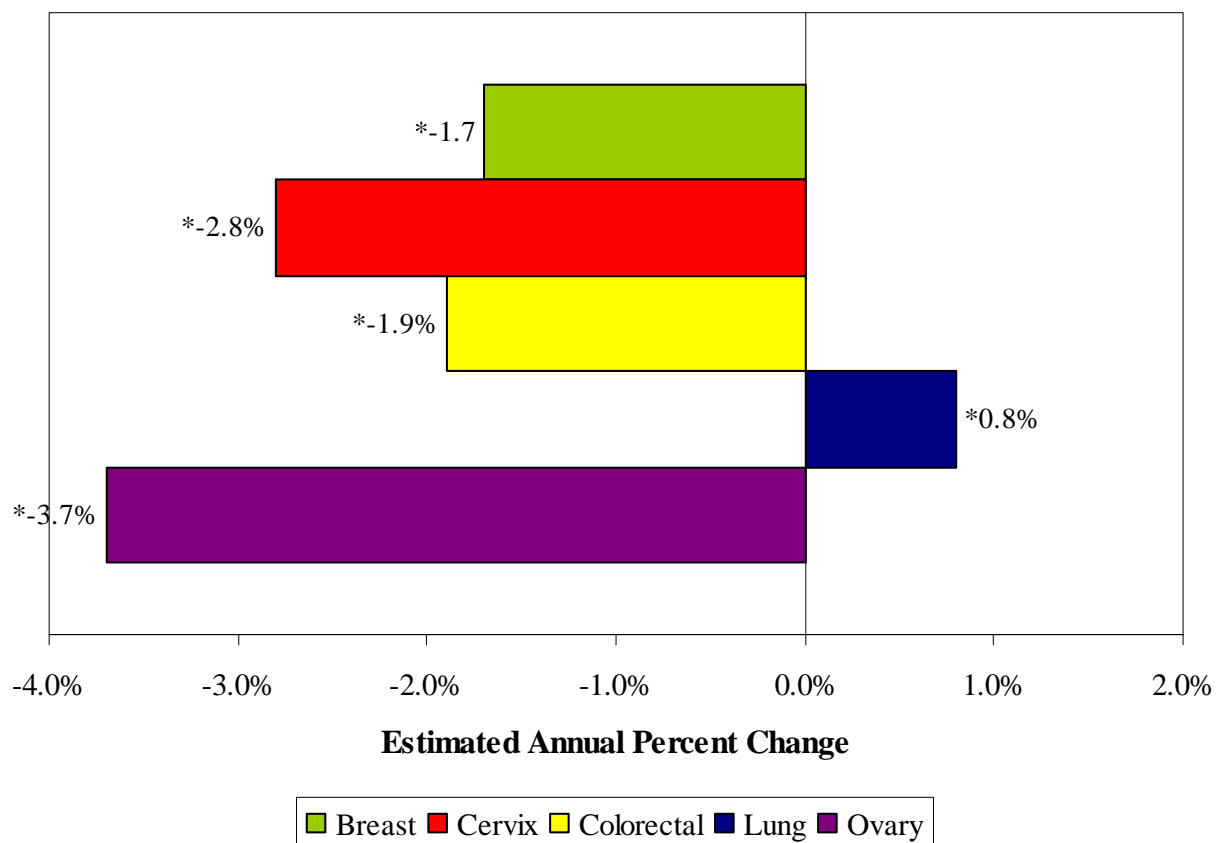
Figure 8: Estimated Annual Percent Change in Incidence Rates by Cancer Site, Michigan 1998-2007



* The EAPC is significantly different from zero ($p \leq .05$).

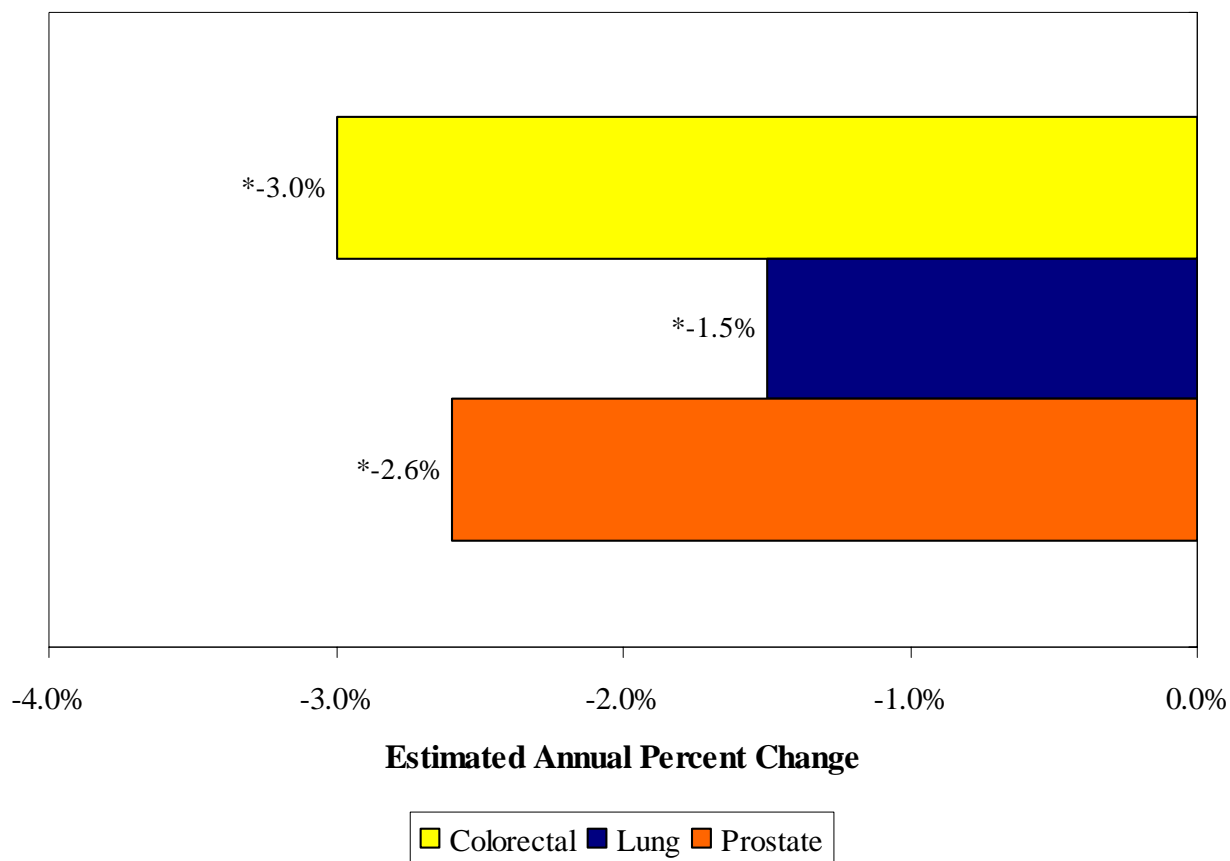
Rates are age-adjusted and computed by gender for breast, cervical and prostate cancer.

Figure 9: Estimated Annual Percent Change in Incidence Rates by Cancer Site, Michigan Females 1998-2007



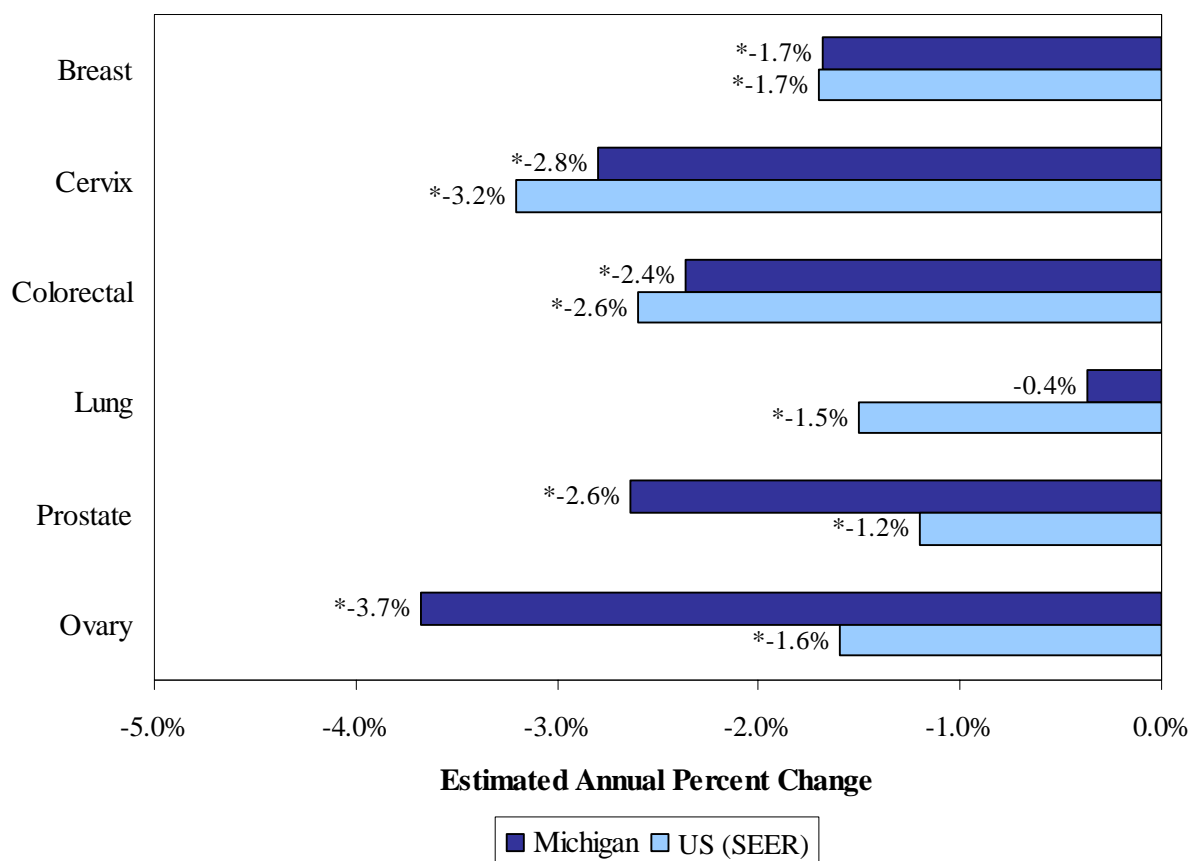
* The EAPC is significantly different from zero ($p \leq .05$).
Rates are age-adjusted and computed by gender.

Figure 10: Estimated Annual Percent Change in Incidence Rates by Cancer Site, Michigan Males 1998-2007



* The EAPC is significantly different from zero ($p \leq .05$).
Rates are age-adjusted and computed by gender.

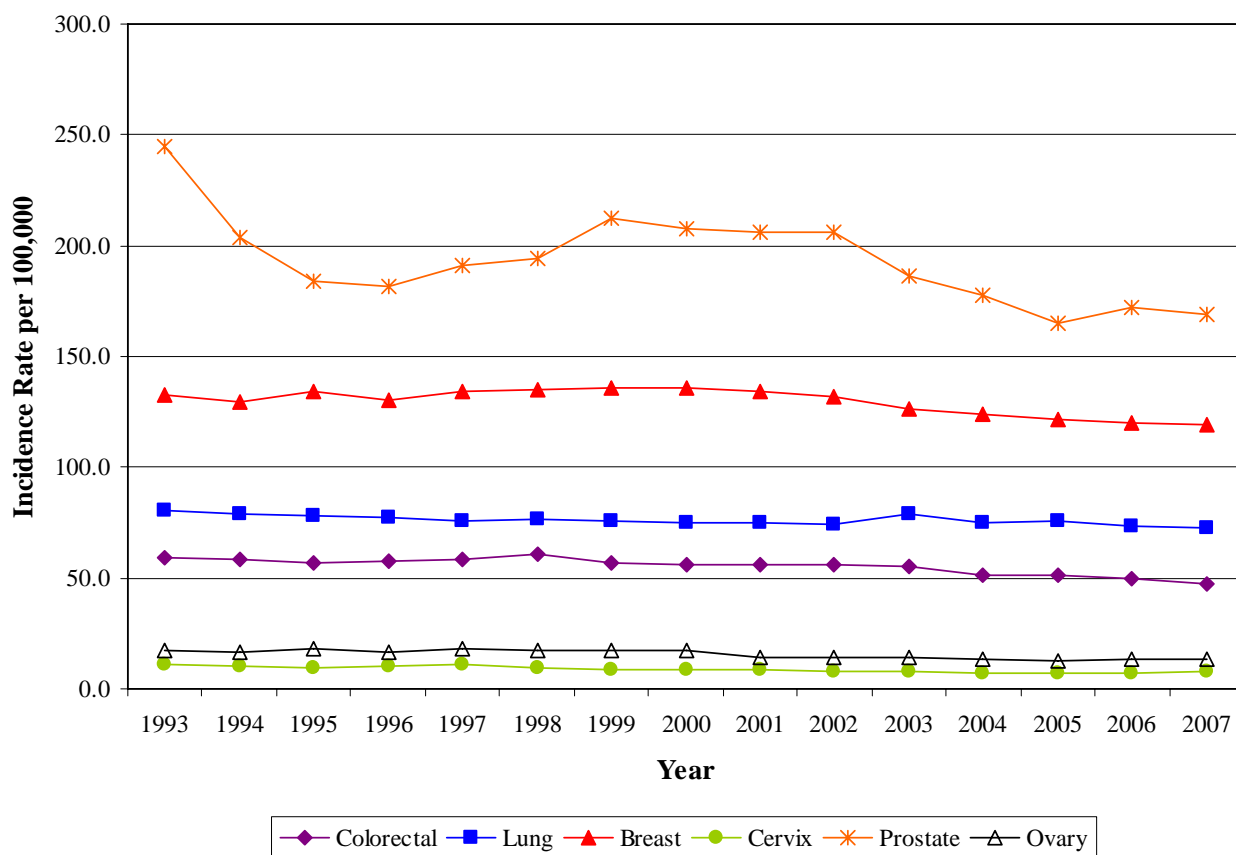
Figure 11: Estimated Annual Percent Change in Incidence Rates, Michigan vs. US
1998-2007



* The EAPC is significantly different from zero ($p \leq .05$).

Rates are age-adjusted and computed by gender for breast, cervical and prostate cancer.

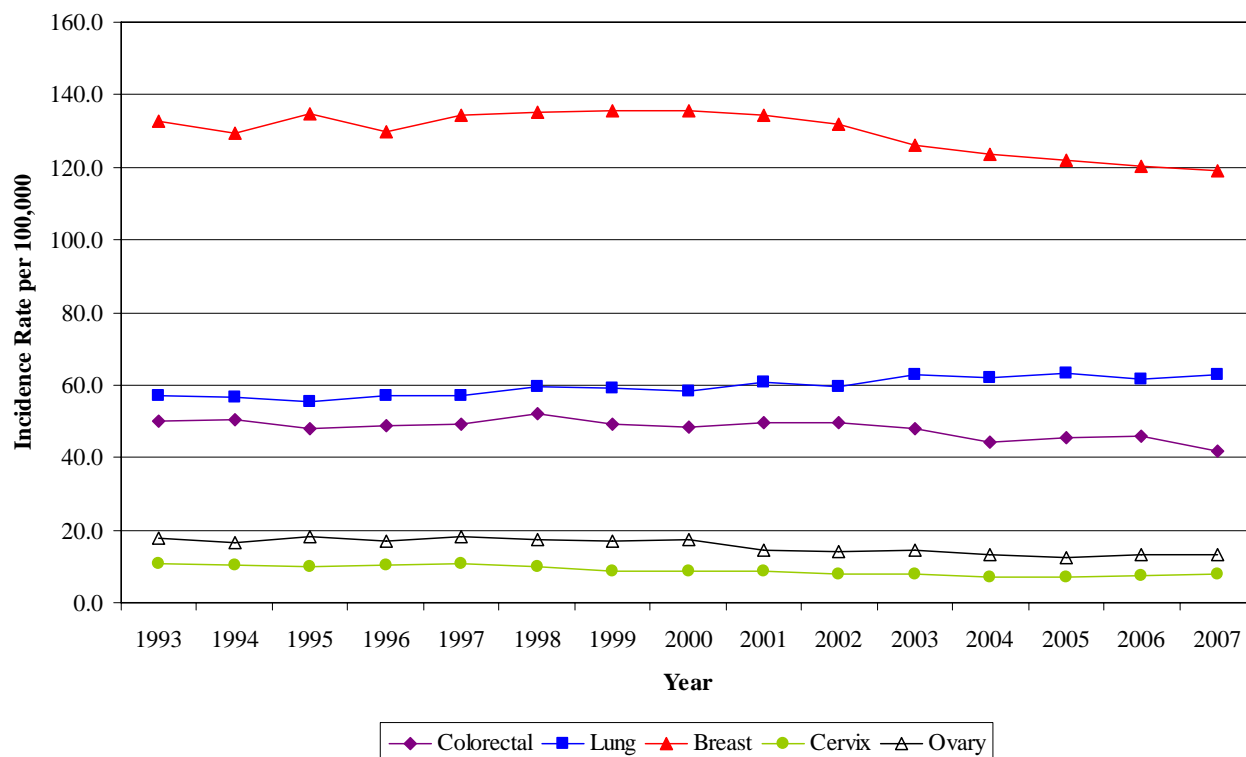
Figure 12: Total Incidence Rates by Cancer Site, Michigan 1993-2007



| | Colorectal | Lung | Breast | Cervix | Prostate | Ovary |
|------|------------|------|--------|--------|----------|-------|
| 1993 | 59.4 | 80.7 | 132.6 | 10.9 | 244.6 | 17.7 |
| 1994 | 58.4 | 78.8 | 129.3 | 10.2 | 204.0 | 16.7 |
| 1995 | 56.7 | 78.2 | 134.6 | 9.7 | 183.6 | 18.2 |
| 1996 | 58.0 | 77.0 | 130.0 | 10.3 | 181.9 | 16.8 |
| 1997 | 58.1 | 75.8 | 134.4 | 10.7 | 191.3 | 18.1 |
| 1998 | 60.8 | 76.7 | 135.1 | 9.8 | 193.9 | 17.3 |
| 1999 | 56.7 | 75.5 | 135.5 | 8.6 | 212.4 | 17.1 |
| 2000 | 55.8 | 75.0 | 135.6 | 8.8 | 207.3 | 17.4 |
| 2001 | 56.0 | 74.9 | 134.3 | 8.8 | 205.9 | 14.4 |
| 2002 | 56.2 | 73.9 | 131.9 | 7.9 | 206.4 | 14.0 |
| 2003 | 55.0 | 78.7 | 126.1 | 7.9 | 186.3 | 14.4 |
| 2004 | 51.2 | 74.9 | 123.6 | 7.1 | 178.0 | 13.4 |
| 2005 | 50.9 | 75.8 | 121.8 | 7.2 | 165.1 | 12.5 |
| 2006 | 50.0 | 73.3 | 120.1 | 7.3 | 171.8 | 13.1 |
| 2007 | 47.0 | 72.4 | 119.2 | 8.0 | 168.7 | 13.2 |

-Rates are age-adjusted per 100,000 gender-specific population.

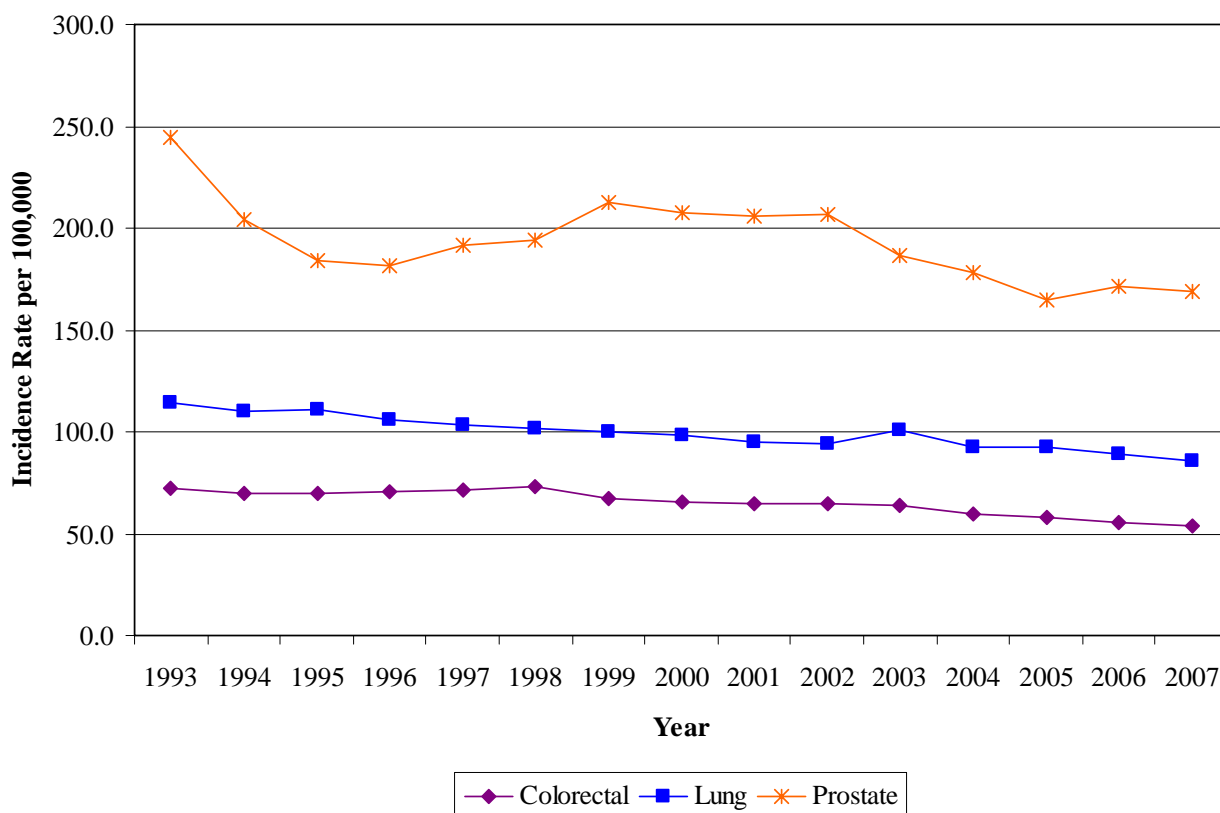
Figure 13: Female Incidence Rates by Cancer Site, Michigan 1993-2007



| | Colorectal | Lung | Breast | Cervix | Ovary |
|------|------------|------|--------|--------|-------|
| 1993 | 49.9 | 57.2 | 132.6 | 10.9 | 17.7 |
| 1994 | 50.3 | 56.8 | 129.3 | 10.2 | 16.7 |
| 1995 | 47.9 | 55.5 | 134.6 | 9.7 | 18.2 |
| 1996 | 48.8 | 56.9 | 130.0 | 10.3 | 16.8 |
| 1997 | 49.1 | 57.0 | 134.4 | 10.7 | 18.1 |
| 1998 | 52.1 | 59.4 | 135.1 | 9.8 | 17.3 |
| 1999 | 49.1 | 59.1 | 135.5 | 8.6 | 17.1 |
| 2000 | 48.3 | 58.2 | 135.6 | 8.8 | 17.4 |
| 2001 | 49.5 | 60.6 | 134.3 | 8.8 | 14.4 |
| 2002 | 49.5 | 59.7 | 131.9 | 7.9 | 14.0 |
| 2003 | 47.8 | 62.8 | 126.1 | 7.9 | 14.4 |
| 2004 | 44.4 | 61.9 | 123.6 | 7.1 | 13.4 |
| 2005 | 45.4 | 63.3 | 121.8 | 7.2 | 12.5 |
| 2006 | 45.7 | 61.7 | 120.1 | 7.3 | 13.1 |
| 2007 | 41.9 | 63.0 | 119.2 | 8.0 | 13.2 |

-Rates are age-adjusted per 100,000 gender-specific population.

Figure 14: Male Incidence Rates by Cancer Site, Michigan 1993-2007



| | Colorectal | Lung | Prostate |
|------|------------|-------|----------|
| 1993 | 72.7 | 114.7 | 244.6 |
| 1994 | 70.0 | 110.3 | 204.0 |
| 1995 | 69.9 | 111.0 | 183.6 |
| 1996 | 70.7 | 106.0 | 181.9 |
| 1997 | 71.1 | 103.1 | 191.3 |
| 1998 | 73.3 | 101.7 | 193.9 |
| 1999 | 67.5 | 99.6 | 212.4 |
| 2000 | 65.9 | 98.4 | 207.3 |
| 2001 | 64.3 | 95.1 | 205.9 |
| 2002 | 64.6 | 93.8 | 206.4 |
| 2003 | 64.2 | 101.0 | 186.3 |
| 2004 | 60.0 | 92.8 | 178.0 |
| 2005 | 58.1 | 92.7 | 165.1 |
| 2006 | 55.6 | 89.4 | 171.8 |
| 2007 | 53.6 | 85.9 | 168.7 |

Rates are age-adjusted per 100,000 gender-specific population.

Cancer-related Behavioral Risk Factors

Table of Contents

| | |
|---|-----------|
| Background | 3 |
| Summary..... | 5 |
| Breast Cancer | 9 |
| Figure 1: Mammogram Utilization Among Michigan Women Aged 40 Years or Older by Population Group, 2008* | 9 |
| Figure 2: Percentage of Michigan Women Aged 40 Years or Older Who Had Annual Mammography and Clinical Breast Exam, 1996-2010 | 10 |
| Table 1: HEDIS Measures* for Breast Cancer Screening, MI vs. US 2003-2010 | 11 |
| Cervical Cancer..... | 12 |
| Figure 3: Cervical Cancer Screening Among Michigan Women Aged 18 Years or Older by Age Group, 2010* | 12 |
| Figure 4: Appropriately Timed Cervical Cancer Screening Among Michigan Women Aged 18 Years or Older, 1996-2010 | 13 |
| Table 2: HEDIS Measures* for Cervical Cancer Screening, MI vs. US 2003-2010..... | 14 |
| Table 3: Sexual Intercourse Behaviors As Reported by Michigan Youth Grades 9 th -12 th , 2009 | 15 |
| Figure 5: Sexual Intercourse Behaviors As Reported by Youth Grades 9 th -12 th : Michigan vs. US, 2009 | 16 |
| Colorectal Cancer | 17 |
| Figure 6: Michigan Adults Aged 50 Years or Older Who Had Any Appropriately Timed* Colorectal Cancer Screening Test by Population Group, 2008..... | 17 |
| Figure 7: Comparison of Survey Years Among Michigan Adults Aged 50 Years or Older Who Had Any Appropriately Timed* Colorectal Cancer Screening Test, 2001-2008..... | 18 |
| Figure 8: Percentage of Michigan Adults Aged 50 Years or Older Who Ever Had a Fecal Occult Blood Test (FOBT), 2001-2010 | 19 |
| Figure 9: Percentage of Michigan Adults Aged 50 Years or Older Who Ever Had a Lower Gastrointestinal Endoscopic Exam, 2001-2010..... | 20 |
| Table 4: HEDIS Measures* for Colorectal Cancer Screening, MI vs. US 2005-2010..... | 21 |
| Lung Cancer | 22 |
| Figure 10: Percentage of Michigan Residents Aged 18 or Older Who Are Current Smokers*, 1996-2010 | 22 |
| Figure 11: Percentage of Michigan Adults Aged 40 Years or Older Who Are Current Smokers* by Population Group, 2008..... | 23 |

| | |
|---|-----------|
| Figure 12: Percentage of Current Smokers Who Attempted to Quit Smoking 1 Day or Longer in the Past Year Among Michigan Residents by Age Group, 2010* | 24 |
| Figure 13: Percentage of Current Smokers Who Attempted to Quit Smoking in the Past Year Among Michigan Residents Aged 40 Years or Older by Population Group, 2008*..... | 25 |
| Figure 14: Current Smokers* Aged 40 Years or Older Whose Doctor Advised of Smoking Cessation Programs and Resources by Population Group, 2008 | 26 |
| Table 5: HEDIS Measures* for Advising Smokers to Quit Tobacco Usage, MI vs. US 2003-2009 | 27 |
| Table 6: HEDIS Measures* for Discussing Medications for Smoking Cessation, MI vs. US 2005-2009 | 27 |
| Table 7: HEDIS Measures* for Discussing Strategies for Smoking Cessation, MI vs. US 2005-2009 | 28 |
| Table 8: Tobacco Use Indicators Among Michigan Youth, 2009..... | 29 |
| Figure 15: Percentage of Michigan Youth Grades 9 th -12 th Who Are Current Smokers, 1997-2009 | 30 |
| Figure 16: Tobacco Use Indicators Among Youth Grades 9 th -12 th , MI vs. US, 2009 | 31 |
| Prostate Cancer | 32 |
| Figure 17: Percentage of Men Aged 40 Years or Older Who Ever Had a Prostate Specific Antigen (PSA) Test by Population Group, 2008..... | 32 |
| Figure 18: Percentage of Men Aged 40 Years or Older Who Ever Discussed Prostate Specific Antigen (PSA) Testing with Their Doctor by Population Group, 2008 | 33 |

Background

Individual cancer screening practices and lifestyle choices are relevant to the incidence, morbidity, and mortality of breast, cervical, colorectal, lung, and prostate cancers. Data relevant to such behaviors are presented in this section of the report.

Behavior data for Michigan residents were obtained from the Michigan Department of Community Health's Behavioral Risk Factor Surveillance System (BRFSS),¹ the Michigan State Board of Education's Michigan Youth Risk Behavior Survey (YRBS),² and the Michigan Public Health Institute's Special Cancer Behavioral Risk Factor Survey (SCBRFS).³

The Michigan Behavioral Risk Factor Surveillance System (BRFSS) is an ongoing state-level telephone survey that the Michigan Department of Community Health regularly conducts in cooperation with the Centers for Disease Control and Prevention (CDC). Each month a random sample of approximately 200 Michigan adults 18 years or older is interviewed. Survey instruments are designed so that a core set of questions dealing with some of the main risk indicators are asked each year while additional questions about specific topic areas are rotated in and out of the protocol. This design allows for more precise estimates of major risk or health promotion behaviors as well as allowing for a broad range of questions to be included. Michigan BRFSS data used in this report were collected from the years of 1996 through 2010 to illustrate trends in prevalence rates over time for various behaviors relevant to cancer prevention and control.¹

Tables and figures of prevalence rates for risk behaviors among Michigan youth included in this section are based on data from the Youth Risk Behavior Surveillance System (YRBSS).² The YRBSS was developed by the CDC to track the prevalence of health-risk behaviors among the nation's youth. The YRBSS has been conducted every other year by state and local education agencies across the United States since the spring of 1990 to assess the prevalence of six categories of health risk behaviors among youth grades nine through twelve. Michigan has administered this survey to students at randomly selected public schools across the state. Questions include many areas of risk behaviors from seatbelt use to illicit drug, alcohol and cigarette use, as well as questions about sexual behavior and other topics. Tobacco use and sexual activity data from the 2009 Michigan YRBS are included in this report.²

Additional data on current prevalence rates of cancer-related risk behaviors presented in this report were obtained from the 2008 Special Cancer Behavioral Risk Factor Survey (SCBRFS).³ The purpose of the SCBRFS is to evaluate cancer screening and prevention in Michigan. Data from this survey are used to assess progress toward improving health-related behaviors and cancer screening in Michigan. The 2008 SCBRFS was focused on men and women in Michigan

¹ Michigan Department of Community Health. (2011). *Behavioral Risk Factor Survey: Preliminary Estimates for Risk Factors and Health Indicators 2010*. Retrieved June 27, 2011 at: http://www.michigan.gov/documents/mdch/2010_MiBRFS_Standard_Tables_FINAL_350512_7.pdf

² Michigan Department of Education. (2011). *Michigan Youth Risk Behavior Survey: Detailed Results by Item 2009*. Retrieved at: www.michigan.gov/yrbs.

³ Michigan Public Health Institute and Michigan Department of Community Health. (2010). *Special Cancer Behavioral Risk Factor Survey 2008*. Retrieved at: <http://www.michigancancer.org/Resources/SpecialMCCReports.cfm>.

40 years of age or older. Using telephone surveillance methodology similar to the Michigan BRFSS, interviews were conducted with a sample of 5,631 Michigan residents from the entire state. To survey special population groups, the SCBRFS sampling design over-sampled African Americans, American Indians, Hispanics, and Arab Americans.

This section also presents a comparison of the Health Plan Employer Data and Information Set (HEDIS) measures for the U.S. and Michigan related to breast, cervical, and colorectal cancer screening, and smoking cessation.⁴ HEDIS measures are a set of performance standards used to measure quality of managed health care plans. The data are used to set standard measures for the National Committee for Quality Assurance's (NCQA) accreditation program and to calculate national performance statistics and benchmarks. NCQA collects the data from managed care organizations and preferred provider organizations. This report includes breast, cervical, and colorectal cancer screening measures, as well as smoking cessation measures such as advising patients to quit, discussing medications, and discussing strategies for quitting. Average measures include all lines of business (HMO, POS, PPO, HMO/POS combined, and HMO/POS/PPO combined).

⁴ National Committee for Quality Assurance (NCQA). (2010). Quality Compass; HEDIS 2010. Retrieved at: www.qualitycompass.org.

Summary

Breast Cancer Screening

The Michigan Cancer Consortium (MCC) and the American Cancer Society (ACS) recommend that all women over the age of 40 years have a mammogram and clinical breast exam (CBE) every year.⁵

Figure 1 shows mammogram utilization among Michigan women aged 40 years or older in 2008. Roughly fifty-nine percent of all age-eligible women had a mammogram and clinical breast exam in the past year. Among the special populations surveyed, Hispanic women reported the lowest rate of mammogram utilization within the past year (37.6%). The reported rates among African American women (64.1%) were higher than that of the general population.

The percentage of women aged 40 years or older who were appropriately screened for breast cancer (by a combination of yearly mammogram and CBE) has increased only slightly in the past 15 years from 52.9% in 1996 to 53.0% in 2010 (Figure 2). However, a slight decline in reported screening rates was observed in more recent years, from 58.4% in 2000 to 53.0% in 2010.

Table 1 presents the HEDIS measure for breast cancer screening in Michigan and the United States. The percentage of women who had a mammogram to screen for breast cancer during the previous two years as measured by HEDIS in 2010 was greater in Michigan (73.4%) than that in the U.S. (69.5%).

Cervical Cancer Screening and Sexual Behaviors

The MCC and the ACS recommend that all women should begin Pap tests starting at age 21 or three years after the onset of sexual activity, whichever comes first.⁶ The onset of sexual activity is of primary interest, as having unprotected sex at a young age increases risk of contracting human papilloma virus (HPV), which is an important risk factor for cervical cancer.⁷

In 2010, 77.7% of women aged 18 years or older had a pap test within the past three years (Figure 3). The percentage of women having a Pap test within the past three years peaks among women aged 30 to 39 years and steadily declines after age 40.

Figure 4 presents the percentage of women age 18 years and older who had a Pap test within the past three years from 1996 to 2010. Overall, the percentage of women having a Pap test within the past three years has slightly declined, from 84.1% of women in 1996 to 77.7% of women in 2010.

⁵ Michigan Cancer Consortium. (2009). *Michigan Cancer Consortium Guidelines for the Early Detection of Breast Cancer*. Retrieved at: <http://www.michigancancer.org/PDFs/EarlyDetectionRecs/MCCBreastCaGuidelines-Dec2009.pdf>

⁶ Michigan Cancer Consortium. (2007). *Michigan Cancer Consortium Guidelines for the Early Detection of Cervical Cancer*. Retrieved at: <http://www.michigancancer.org/PDFs/EarlyDetectionRecs/MCCCervCAGuidelines-Dec2007.pdf>.

⁷ American Cancer Society. (2011). *Cancer Reference Information: What Causes Cancer of the Cervix?* Retrieved June, 27, 2011 at: http://www.cancer.org/docroot/CRI/CRI_0.asp.

Table 2 presents the HEDIS measures for cervical cancer screening in Michigan and the United States. In 2010, the percentage of women age 21 to 64 years who had a Pap test to screen for cervical cancer during the previous three years was greater in Michigan (81.0%) compared to the U.S. (76.1%).

Table 3 presents indicators of sexual behavior among Michigan youth. Over 45% of ninth to twelfth grade students reported having ever had sexual intercourse in 2009. Of these students, only 61.4% used a condom during their last sexual intercourse, and 13.6% had sexual intercourse with four or more people during their lives. When compared to youth nationwide (46.0%), fewer Michigan youth (45.6%) reported ever having sexual intercourse (Figure 5).

Colorectal Cancer Screening

In 2009, the recommendations by the MCC and the ACS for colorectal cancer screening include five screening schedule options for a person at average risk for colorectal cancer. According to these guidelines, all persons at average risk should be screened for colorectal cancer starting at age 50. Appropriate screening may consist of an annual fecal occult blood test (FOBT), a sigmoidoscopy exam once every five years, a sigmoidoscopy exam once every five years with an annual FOBT, a double contrast barium enema (DCBE) once every five years, or a colonoscopy once every ten years.⁸

In 2008, 60.8% of adults aged 50 years or older had one of the recommended colorectal cancer screening tests within the appropriate time-frame (Figure 6). Among the special population groups surveyed, the percentage of American Indian men and women who received an appropriately-timed colorectal cancer screening test was similar (59.2%) to that of the general population. African American (57.4%), Hispanic (46.5%), and Arab American (45.6%) men and women had lower colorectal cancer screening rates than the general population, while Asian American men and women (63.7%) had higher colorectal cancer screening rates than the general population.

Figure 7 presents the percentage of men and women age 50 years and older who had any appropriately-timed colorectal cancer screening exam from 2001 to 2008. Since 2001, the percentage of men and women within the general population who received an appropriately-timed colorectal screening exam has increased from 49.5% in 2001 to 60.8% in 2008. A similar increase in screening was seen in the African American population, increasing from 51.8% in 2001 to 57.4% in 2008.

The percentage of men and women age 50 years and older who ever had a FOBT decreased from 51.2% in 2001 to 44.5% in 2010 (Figure 8). However, the percentage of men and women age 50 years and older who ever had a lower gastrointestinal endoscopic exam increased from 55.2% in 2001 to 70.9% in 2010 (Figure 9).

⁸ In 2009, the Michigan Cancer Consortium revised the guidelines for early detection of colorectal cancer to include additional tests. Michigan Cancer Consortium. (2009). MCC Guidelines for the Early Detection of Colorectal Cancer. Retrieved at: <http://www.michigancancer.org/PDFs/EarlyDetectionRecs/MCCColoCaGuidelines-02.19.09.pdf>.

Table 4 presents the HEDIS measures for colorectal cancer screening in Michigan and the United States. In 2010, the percentage of men and women age 50 to 80 years who had an appropriate colorectal cancer screening exam during the appropriate timeframe was greater in Michigan (58.6%) than in the U.S. (54.5%).

Lung Cancer Prevention

Although cigarette smoking is a risk factor for other types of cancer, it is the single most important risk factor in the development of lung cancer. According to the ACS, about 87% of lung cancers deaths are attributed to smoking, and additional cases are attributed to environmental exposure to tobacco smoke.⁹

Figure 10 presents the percentage of Michigan adults, age 18 years or older who were current smokers from 1996 to 2010. Overall, the prevalence of current smokers has declined from 25.6% of adults age 18 years and older in 1996 to 18.9% of adults in 2010.

In 2008, 20.6% of adults aged 40 years or older were current smokers (Figure 11). Of the special populations surveyed, the African American (25.4%), American Indian (21.2%), and Hispanic (24.2%) populations had current smoking rates greater than that of the general population, while Arab American population aged 40 years or older had rates (19.3%) similar to the general population of Michigan. The Asian American population of adults aged 40 years or older had a current smoking rate significantly lower than the general population (6.7%).

In 2010, 62.3% of current smokers of all ages attempted to quit smoking one day or more in the past year (Figure 12). Rates for attempting to quit were highest among adults age 18 to 24 years (78.7%) and lowest among smokers aged 75 years and older (56.1%).

In 2008, 53.8% of current smokers aged 40 years or older attempted to quit in the past year (Figure 13). The rates for attempting to quit were highest among Asian Americans (82.4%) and lowest among the Hispanic population (37.6%).

In 2008, 91.4% of those surveyed within the general population reported having been advised by a doctor of smoking cessation programs and resources (Figure 14). The percentage of adults 40 years and older who were advised by a doctor of smoking cessation programs or resources was lower among the African American (88.6%), Hispanic (88.8%) and Arab American (88.2%) populations, and higher among the American Indian (95.4%) and Asian American (92.6%) populations. The Arab American population was the least likely to report being advised of cessation resources or programs by a doctor (88.2%).

Table 5 shows HEDIS measures for current smokers aged 18 years or older, who were advised by a physician to quit tobacco usage. In 2009, the percentage of current smokers who were advised to quit by their physician was greater in Michigan (79.9%) than the U.S. (75.2%). Table 6 presents the HEDIS measures for current smokers aged 18 years and older, who discussed medications for smoking cessation with a physician. In 2009, 57.6% of current smokers in

⁹American Cancer Society. (2010). Lung Cancer (Non-Small Cell). Retrieved June 28, 2011 at: <http://www.cancer.org/Cancer/LungCancer-Non-SmallCell/DetailedGuide/non-small-cell-lung-cancer-risk-factors>

Michigan were advised of cessation medications, compared to 53.4% of current smokers in the U.S. Table 7 presents the HEDIS measures of current smokers aged 18 years and older whose physician recommended or discussed smoking cessation strategies or methods. In 2009, 55.5% of current smokers in Michigan had received recommendations or discussed smoking cessation strategies or methods, compared to 47.9% of current smokers in the U.S.

In 2009, approximately 18.8% of Michigan youth had smoked cigarettes on one or more day in the past 30 days (Table 8). The percent of youth who smoked cigarettes on one or more of the past thirty days increases with grade level, with highest percentage reported among 12th graders (23.4%). The percent of youth who smoked cigarettes on one or more day in the past 30 days was higher among White youth (19.9%) compared with Black youth (11.0%).

The percent of current smokers among Michigan youth has decreased from 38.2% in 1997 to 18.8% in 2009 (Figure 15). Figure 16 shows tobacco use indicators among Michigan and the United States. More Michigan students (53.6%) tried to quit smoking than students in the U.S. (50.8%).

Prostate Cancer

Currently the effectiveness of prostate cancer screening is a topic of investigation.¹⁰ Even though prostate cancer mortality has steadily decreased since the 1990s, it is unclear whether the decrease in mortality is due to early detection or to better treatment. Due to the uncertainty of rate of growth of certain prostate cancers, finding and treating prostate cancer early may help some men live longer, but may have no impact on the life span of other men. In addition, prostate cancer treatments may cause short-term or long-term side effects that affect a man's quality of life. Currently, the MCC and the ACS do not recommend routine testing for prostate cancer. The current recommendation is for men to discuss screening with their health care provider and understand the advantages and disadvantages of having a prostate specific antigen test (PSA) and digital rectal exam (DRE) on a routine basis for early detection of prostate cancer.

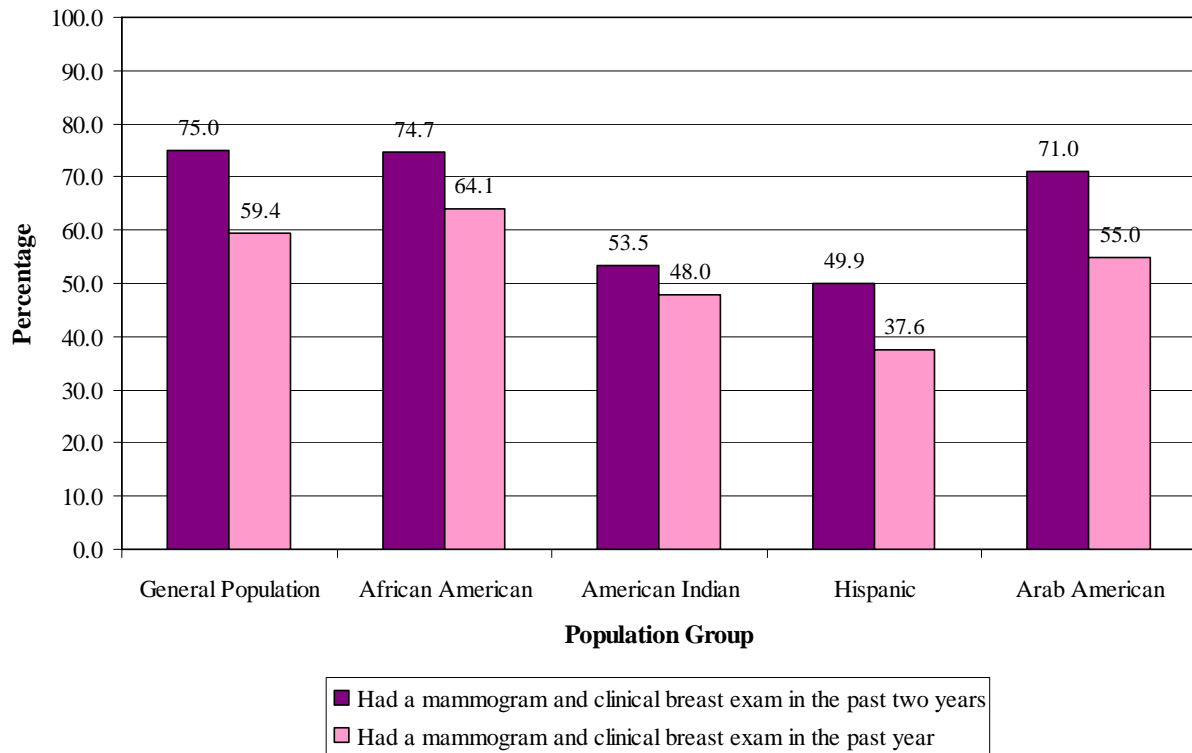
During 2008, 56.8% of men aged 40 years or older had ever had a PSA test (Figure 17). The percentage of men within the African American population (68.9%) that ever had a PSA test was significantly higher to that in the general population. A smaller percentage of men within the American Indian population (35.7%), Hispanic population (41.4%), Arab American (53.5%) and Asian American population (39.0%) reported ever having a PSA test compared to the general population.

Figure 18 presents the percentage of Michigan men who have ever discussed PSA testing with a doctor. Among the general population, 57.3% of men had discussed PSA testing with a doctor. The percentage of men within the African American population (61.1%) and Arab American population (65.3%) had discussed PSA testing with a physician greater to that in the general population, while a smaller percentage of men within the American Indian population (44.5%), Hispanic population (44.5%) and Asian American population (42.4%) discussed PSA testing with a doctor compared to the general population.

¹⁰ American Cancer Society. (2010). Prostate Cancer Overview. Retrieved June 29, 2011 at: <http://www.cancer.org/Cancer/ProstateCancer/OverviewGuide/prostate-cancer-overview-diagnosed>

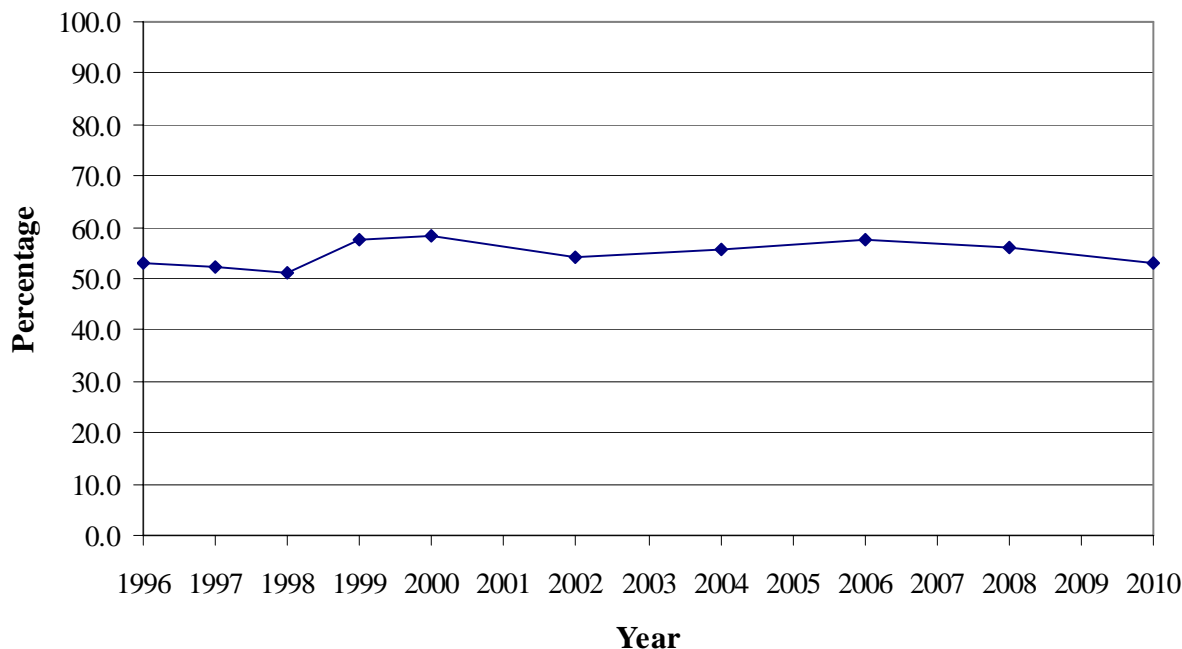
Breast Cancer

Figure 1: Mammogram Utilization among Michigan Women Aged 40 Years or Older by Population Group, 2008*



*Respondents whose last breast exam was done because of a problem were not included in analysis of appropriate screening.

Figure 2: Percentage of Michigan Women Aged 40 Years or Older Who Had Annual Mammography and Clinical Breast Exam, 1996-2010



| Year | Had Appropriately Timed Breast Cancer Screening ^{1,2} (%) |
|-------------------|--|
| 1996 | 52.9 |
| 1997 ¹ | 55.4, 52.4 |
| 1998 | 51.2 |
| 1999 | 57.6 |
| 2000 | 58.4 |
| 2001 | (Not asked) |
| 2002 | 54.2 |
| 2003 | (Not asked) |
| 2004 | 55.7 |
| 2005 | (Not asked) |
| 2006 | 57.2 |
| 2007 | (Not asked) |
| 2008 | 56.0 |
| 2009 | (Not asked) |
| 2010* | 53.0 |

¹ The ACS recommended time frame for appropriate mammography screening changed in 1997 to annually for all women 40 years of age or older. For all previous years, the recommendation was biannual screening for women aged 40 to 49 and annual screening for women aged 50+ years. As appropriate breast screening is a combination of appropriate CBE and appropriate mammography (each within the past year), this indicator changed as well.

² Data include diagnostic tests.

* 2010 Michigan Behavioral Risk Factor Survey.

Table 1: HEDIS Measures* for Breast Cancer Screening, MI vs. US 2003-2010

| | Michigan | National |
|--------|----------|----------|
| 2003 | 76.4 | 74.9 |
| 2004 | 77.0 | 75.3 |
| 2005 | 77.2 | 73.4 |
| 2006^ | 75.2 | 72.0 |
| 2007** | 73.7 | 68.9 |
| 2008 | 72.6 | 67.3 |
| 2009 | 70.5 | 68.4 |
| 2010 | 73.4 | 69.5 |

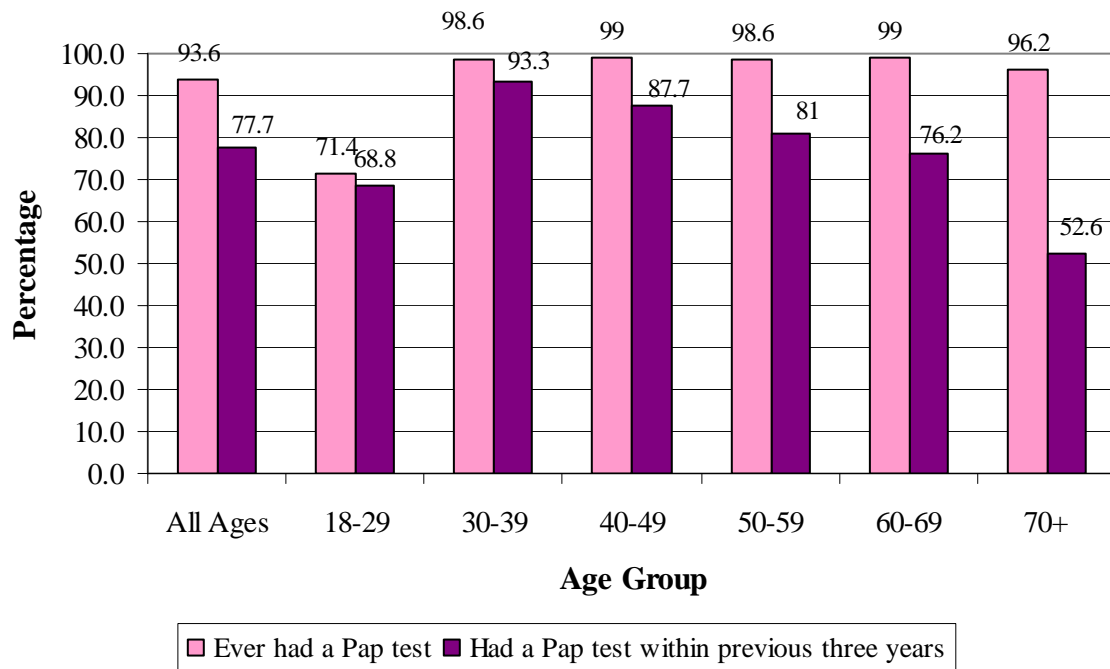
*The HEDIS measure is the percentage of women who had a mammogram to screen for breast cancer during the previous two years. Measures include all lines of business HMO, POS, PPO, HMO/POS combined, and HMO/POS/PPO combined.

^ In 2006, the hybrid methodology was retired for this measure. Trending 2006 performance with prior years' data should be considered with caution.

**In years prior to 2007, the HEDIS measure included women age 52 to 69 years only. In 2007, the HEDIS measure was changed to encompass women age 42 to 69 years.

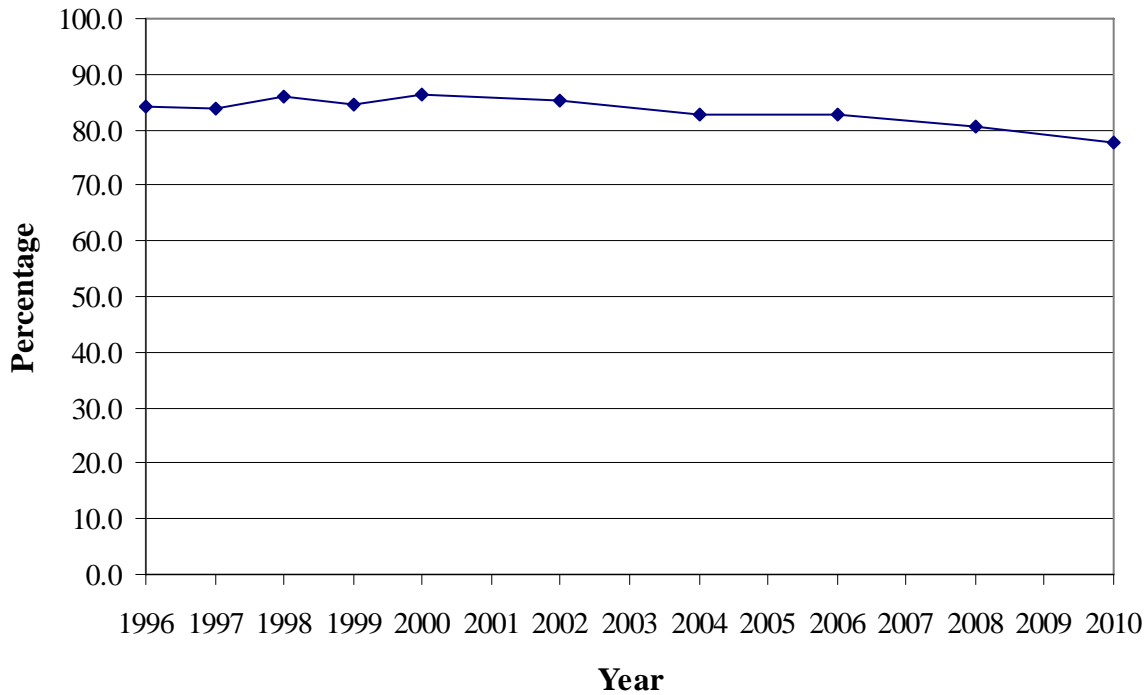
Cervical Cancer

Figure 3: Cervical Cancer Screening Among Michigan Women Aged 18 Years or Older by Age Group, 2010*



* Data include diagnostic tests; 2010 Michigan Behavioral Risk Factor Survey.

Figure 4: Appropriately-Timed Cervical Cancer Screening Among Michigan Women Aged 18 Years or Older, 1996-2010



| Year | Had Appropriately Timed Cervical Cancer Screening (Within Past 3 Years) ^{1,2} (%) |
|-------|---|
| 1996 | 84.1 |
| 1997 | 83.8 |
| 1998 | 85.8 |
| 1999 | 84.4 |
| 2000 | 86.2 |
| 2001 | (Not asked) |
| 2002 | 85.2 |
| 2003 | (Not asked) |
| 2004 | 82.6 |
| 2005 | (Not asked) |
| 2006 | 82.6 |
| 2007 | (Not asked) |
| 2008 | 80.5 |
| 2009 | (Not asked) |
| 2010* | 77.7 |

¹ Percentage of women ages 18 or older reported to have had a pap smear in the past 3 years.

² Data include diagnostic tests.

*2010 Michigan Behavioral Risk Factor Survey.

Table 2: HEDIS Measures* for Cervical Cancer Screening, MI vs. US 2003-2010

| | Michigan | National |
|-------|----------|----------|
| 2003 | 80.0 | 80.5 |
| 2004 | 81.8 | 81.8 |
| 2005 | 83.7 | 80.9 |
| 2006 | 85.8 | 81.8 |
| 2007^ | 85.5 | 81.0 |
| 2008 | 83.8 | 78.4 |
| 2009 | 80.5 | 78.0 |
| 2010 | 81.0 | 76.1 |

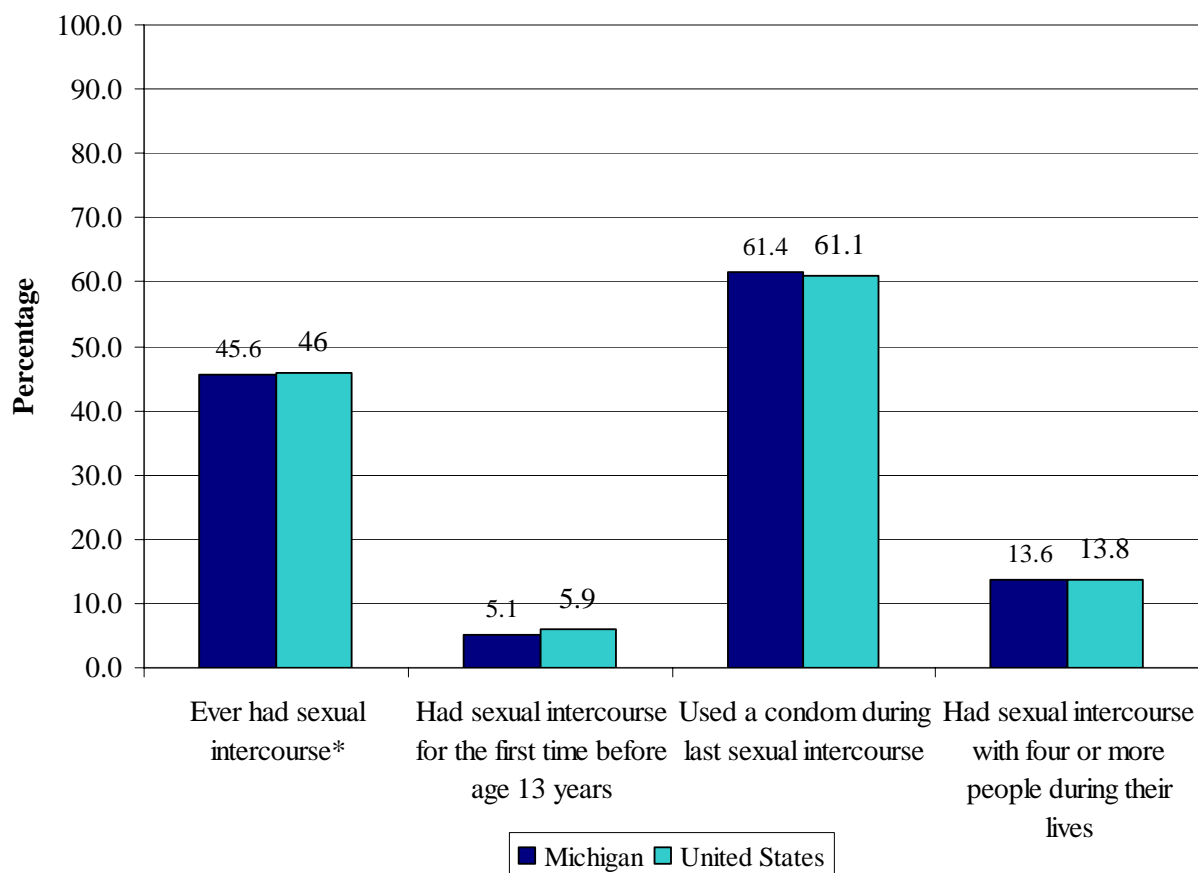
*The HEDIS measure is the percentage of women 21 to 64 years of age who received one or more Pap tests to screen for cervical cancer in the past 3 years. Measures include all lines of business HMO, POS, PPO, HMO/POS combined, and HMO/POS/PPO combined.

^In 2007, the lower age limit was raised to 21 years of age. Trending 2007 performance with prior years' data should be considered with caution.

Table 3: Sexual Intercourse Behaviors As Reported by Michigan Youth
Grades 9-12, 2009

| Behavior | Total (%) | Gender | | Grades | | | | Race | |
|---|----------------------|---------------------|-----------------------|------------------|-------------------|-------------------|-------------------|----------------------|----------------------|
| | | Male (%) | Female (%) | 9 (%) | 10 (%) | 11 (%) | 12 (%) | White (%) | Black (%) |
| Percentage of students who had sexual intercourse | 45.6 | 46.9 | 44.3 | 27.1 | 39.8 | 53.8 | 65.0 | 41.2 | 65.9 |
| Percentage of students who had sexual intercourse for the first time before age 13 | 5.1 | 7.2 | 3.0 | 5.3 | 4.8 | 6.1 | 3.8 | 3.3 | 12.4 |
| Of students who had sexual intercourse during the past three months, % who used a condom during last sexual intercourse | 61.4 | 68.2 | 55.2 | 63.0 | 62.7 | 61.8 | 59.9 | 59.0 | 68.5 |
| Percentage of students who had sexual intercourse with four or more people during their lives | 13.6 | 15.7 | 11.5 | 6.4 | 10.1 | 16.9 | 22.2 | 10.2 | 27.6 |

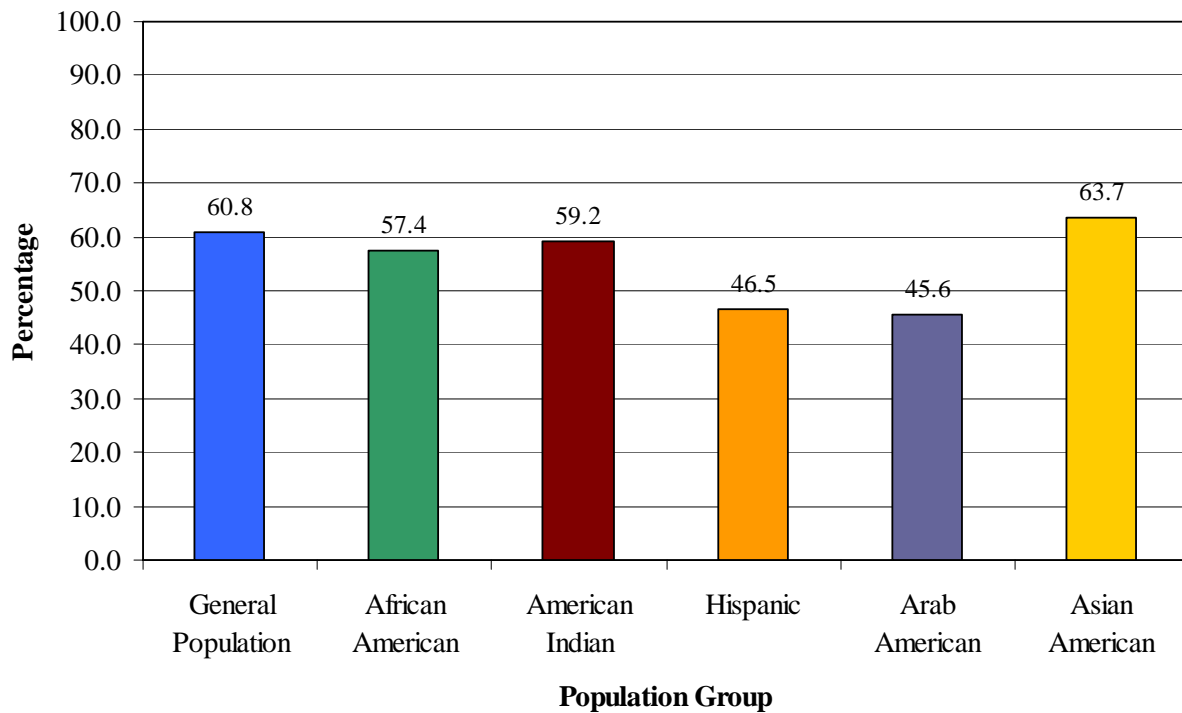
Figure 5: Sexual Intercourse Behaviors As Reported by Youth Grades 9-12:
Michigan vs. US, 2009



*Difference is statistically significant at $p < 0.05$.

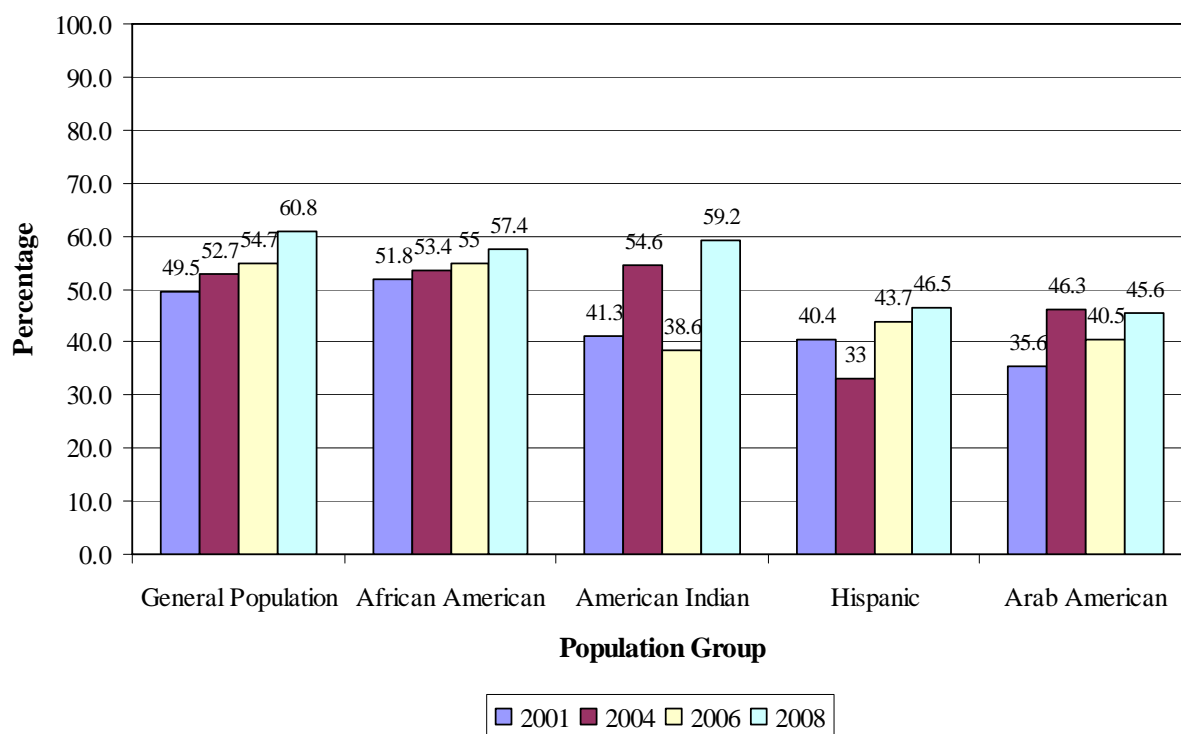
Colorectal Cancer

Figure 6: Michigan Adults Aged 50 Years or Older Who Had Any Appropriately-Timed* Colorectal Cancer Screening Test by Population Group, 2008



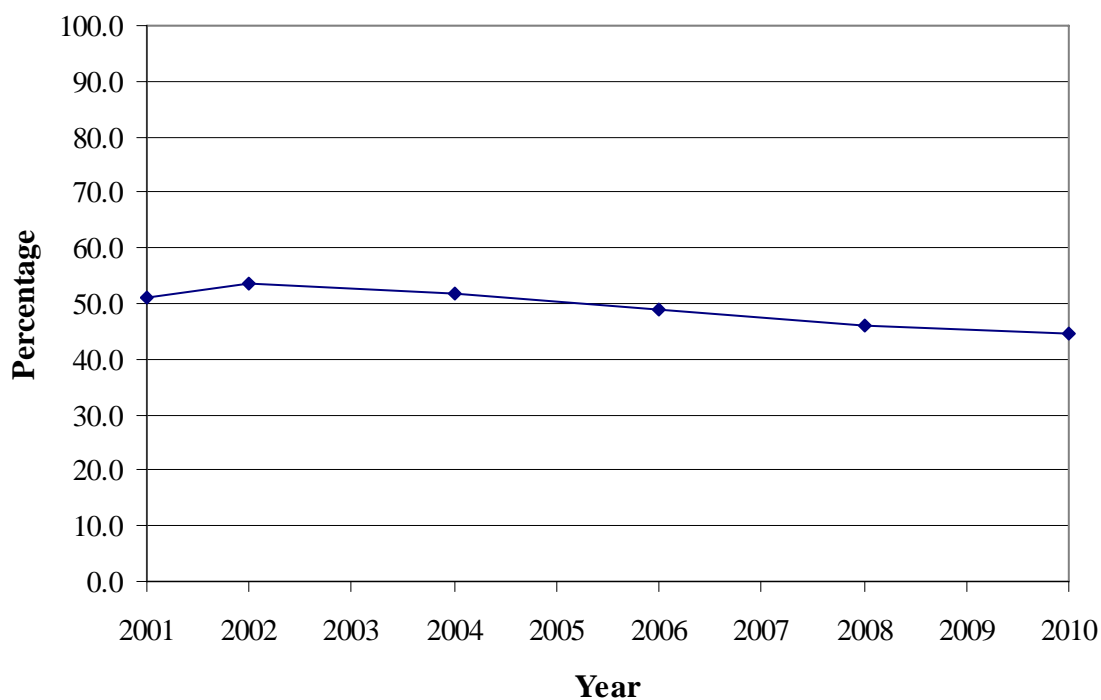
*In 2010, the MCC's recommendation for colorectal cancer screening was to have either a yearly fecal occult blood test (FOBT), a sigmoidoscopy every five years, a yearly FOBT with a sigmoidoscopy every five years, a colonoscopy every ten years, or a double contrast barium enema (DCBE) every five years.

Figure 7: Comparison of Survey Years among Michigan Adults Aged 50 Years or Older Who Had Any Appropriately Timed* Colorectal Cancer Screening Test, 2001-2008



*In 2010, the MCC's recommendation for colorectal cancer screening was to have either a yearly fecal occult blood test (FOBT), a sigmoidoscopy every five years, a yearly FOBT with a sigmoidoscopy every five years, a colonoscopy every ten years, or a double contrast barium enema (DCBE) every five years.

Figure 8: Percentage of Michigan Adults Aged 50 Years or Older Who Ever Had a Fecal Occult Blood Test (FOBT), 2001-2010

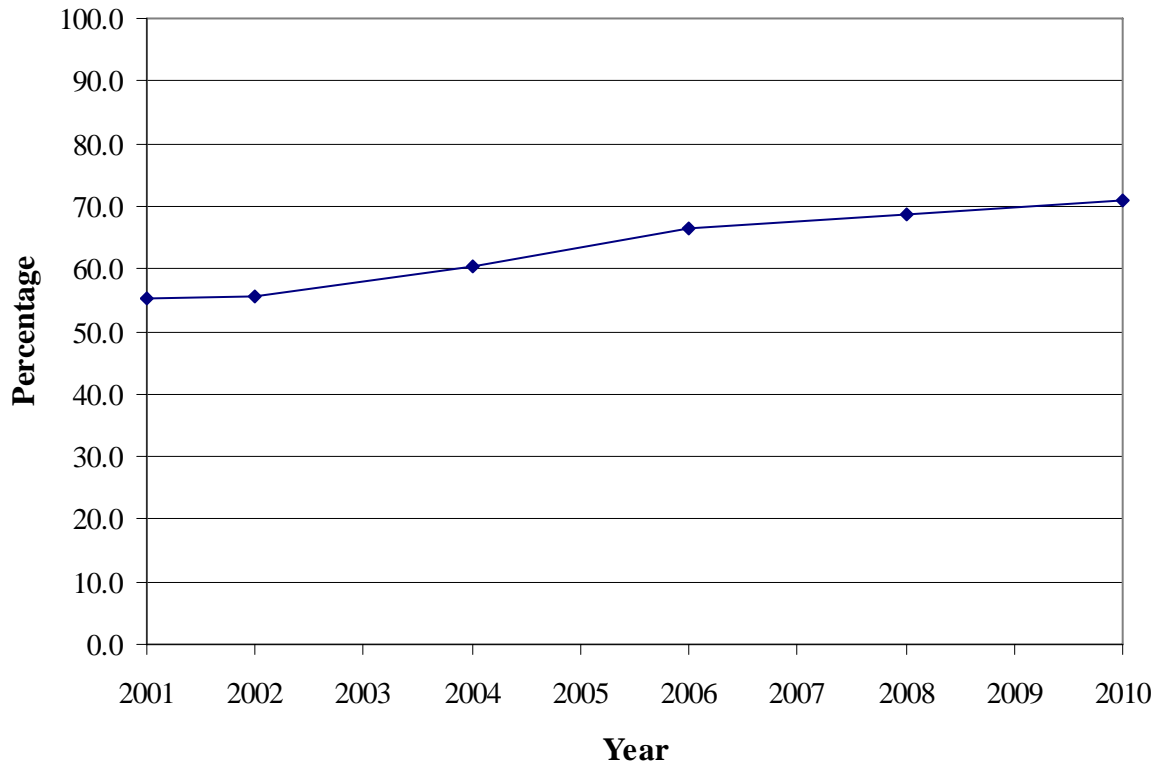


| Year | Ever Had an FOBT ¹ (%) |
|-------|--------------------------------------|
| 2001 | 51.2 |
| 2002 | 53.6 |
| 2003 | (Not asked) |
| 2004 | 51.9 |
| 2005 | (Not asked) |
| 2006 | 49.1 |
| 2007 | (Not asked) |
| 2008 | 45.9 |
| 2009 | (Not asked) |
| 2010* | 44.5 |

¹ Data include diagnostic tests.

*2010 Michigan Behavioral Risk Factor Survey.

Figure 9: Percentage of Michigan Adults Aged 50 Years or Older Who Ever Had a Lower Gastrointestinal Endoscopic Exam, 2001-2010



| Year | Ever Had a Lower Gastrointestinal Endoscopic Exam (%) ^{1,2} |
|-------|--|
| 2001 | 55.2 |
| 2002 | 55.6 |
| 2003 | (Not asked) |
| 2004 | 60.3 |
| 2005 | (Not asked) |
| 2006 | 66.3 |
| 2007 | (Not asked) |
| 2008 | 68.6 |
| 2009 | (Not asked) |
| 2010* | 70.9 |

¹ Question asked: Ever had a sigmoidoscopy or colonoscopy?

² Data include diagnostic tests.

*2010 Michigan Behavioral Risk Factor Survey.

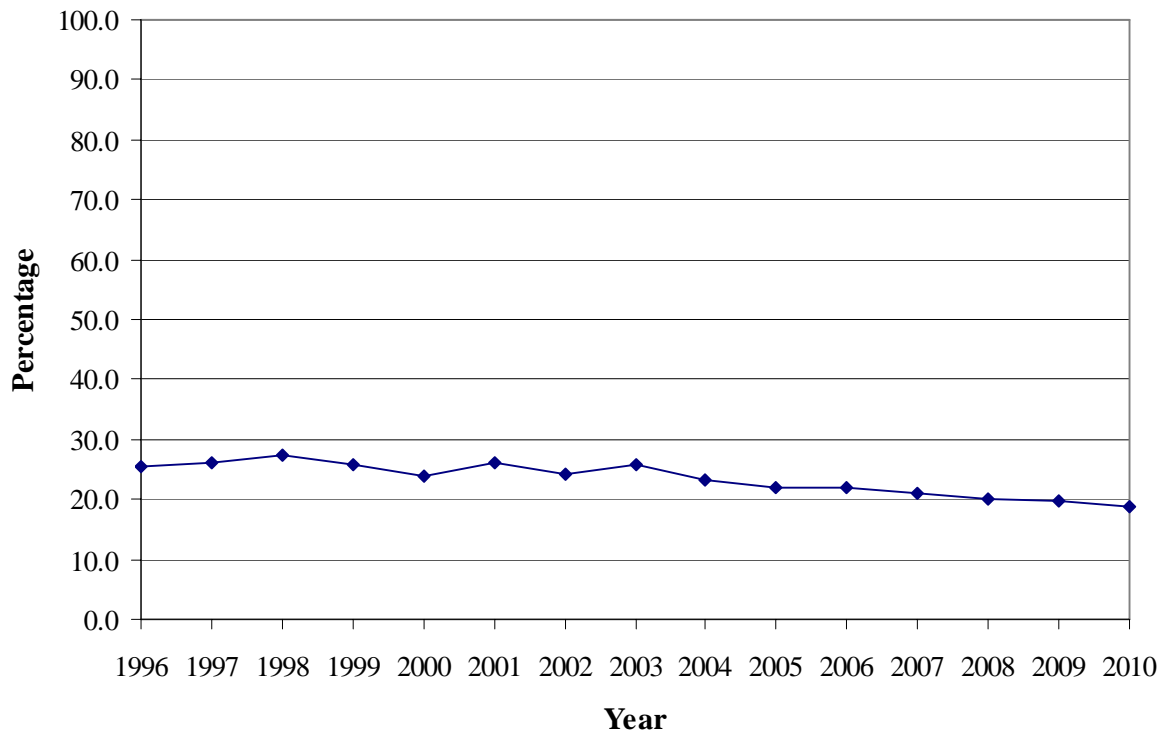
**Table 4: HEDIS Measures* for Colorectal Cancer Screening,
MI vs. US 2005-2010**

| | Michigan | National |
|------|----------|----------|
| 2005 | 51.3 | 49.0 |
| 2006 | 55.1 | 52.3 |
| 2007 | 56.6 | 54.5 |
| 2008 | 56.2 | 51.3 |
| 2009 | 53.1 | 52.6 |
| 2010 | 58.6 | 54.5 |

* The HEDIS measure is the percentage of adults 50 to 80 years of age who had an appropriate screening for colorectal cancer, which includes having a fecal occult blood test within the past year, a flexible sigmoidoscopy in the past 5 years, a double contrast barium enema in the past 5 years, or a colonoscopy in the past 10 years. Measures include all lines of business HMO, POS, PPO, HMO/POS combined, and HMO/POS/PPO combined.

Lung Cancer

Figure 10: Percentage of Michigan Residents Aged 18 or Older Who Are Current Smokers*, 1996-2010

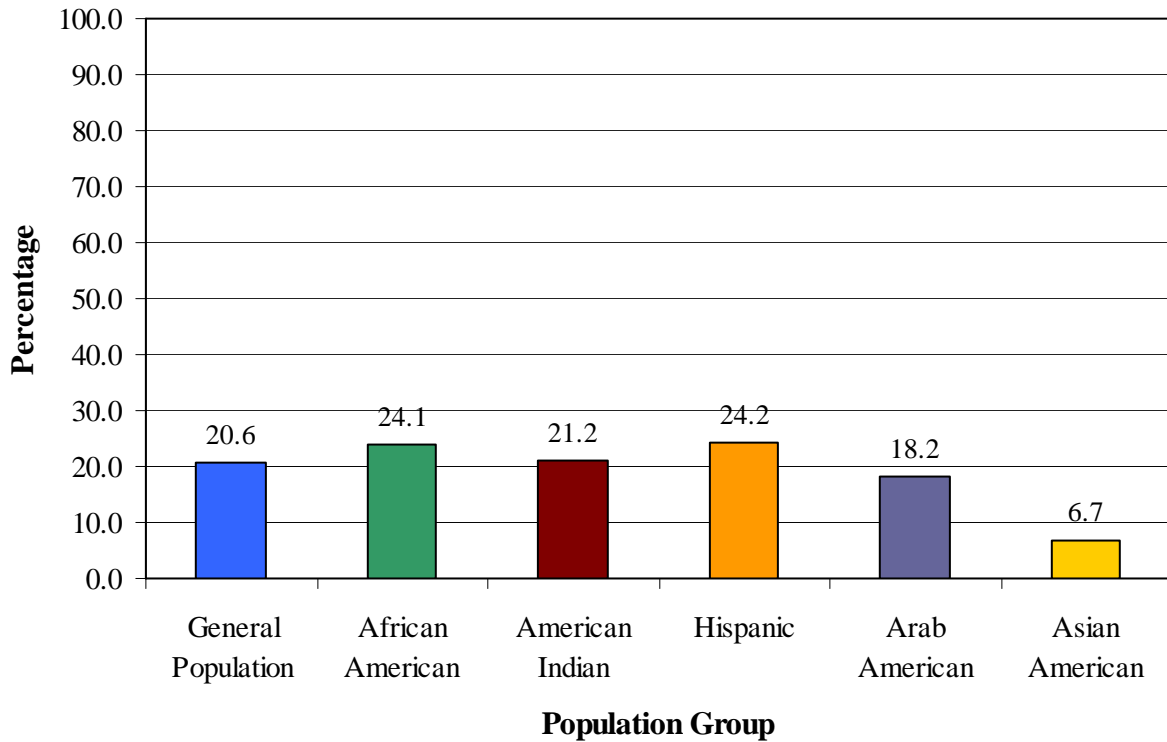


| Year | Current Smokers ¹ (%) |
|-------|-------------------------------------|
| 1996 | 25.6 |
| 1997 | 26.2 |
| 1998 | 27.5 |
| 1999 | 25.7 |
| 2000 | 24.0 |
| 2001 | 26.1 |
| 2002 | 24.1 |
| 2003 | 25.8 |
| 2004 | 23.4 |
| 2005 | 21.9 |
| 2006 | 22.1 |
| 2007 | 21.1 |
| 2008 | 20.2 |
| 2009 | 19.8 |
| 2010* | 18.9 |

¹Current smoking defined as having smoked 100 or more cigarettes in lifetime and smoke cigarettes now, either every day or some days.

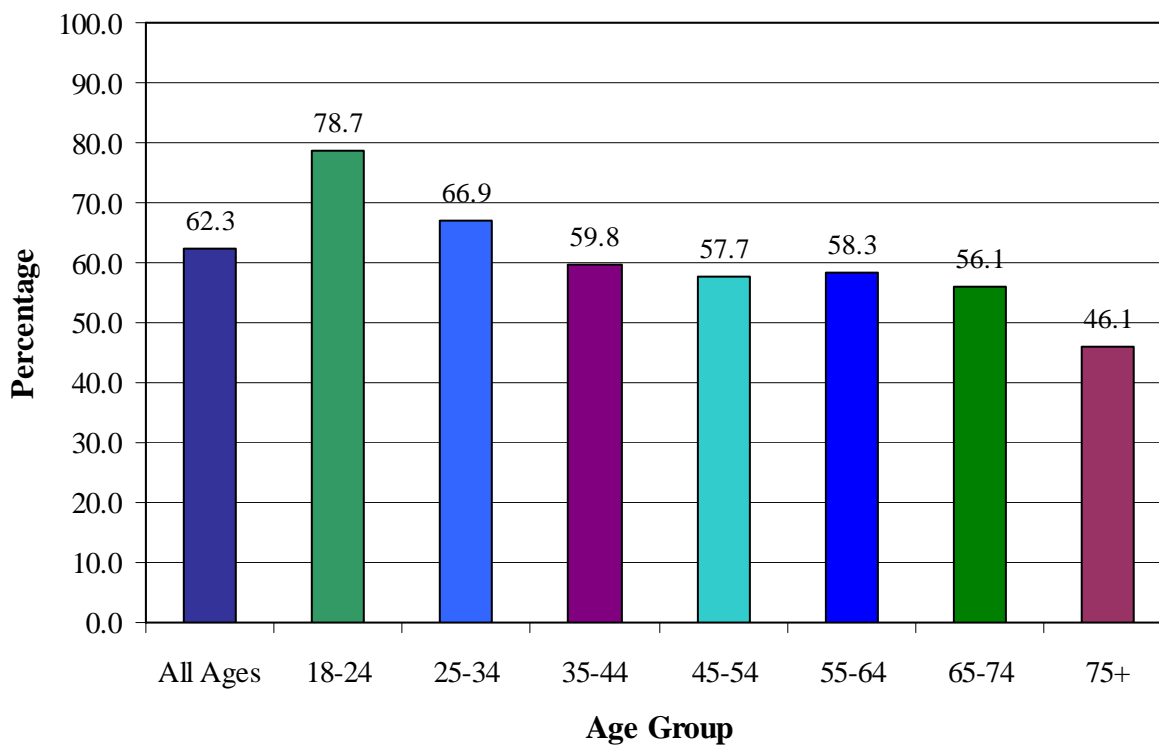
*2010 Michigan Behavioral Risk Factor Survey.

Figure 11: Percentage of Michigan Adults Aged 40 Years or Older Who Are Current Smokers* by Population Group, 2008



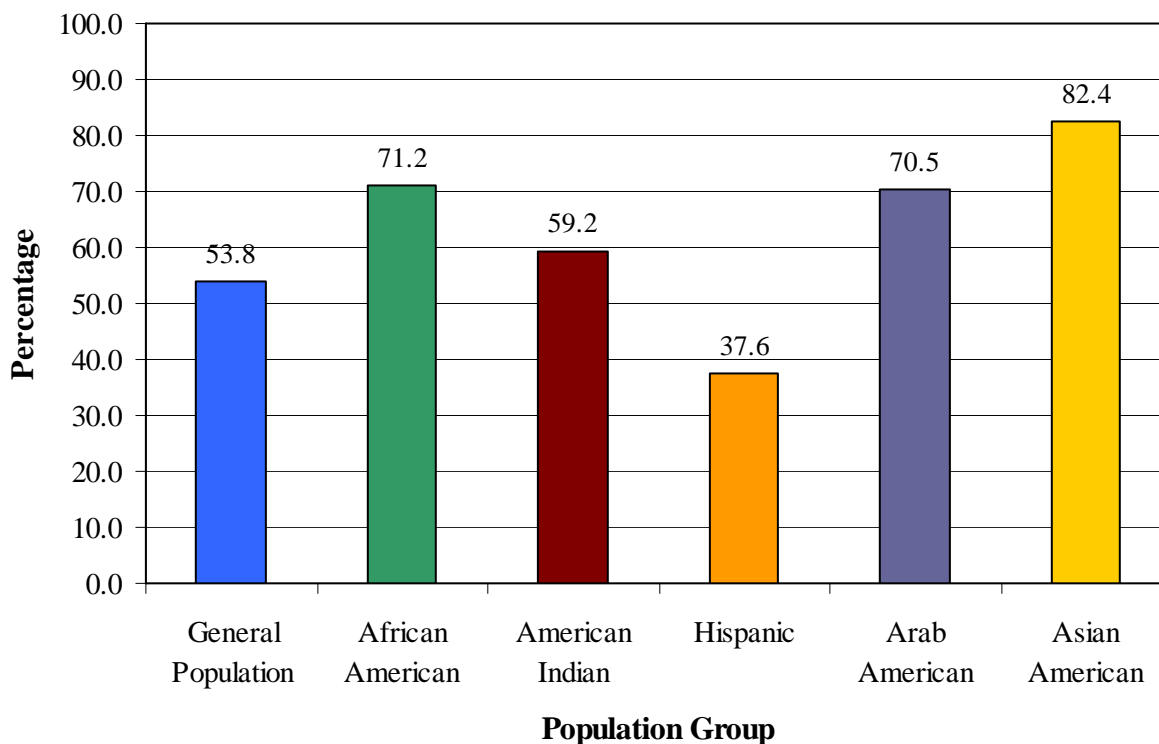
*Current smoking defined as having smoked 100 or more cigarettes in lifetime and smoke cigarettes now, either every day or some days.

Figure 12: Percentage of Current Smokers Who Attempted to Quit Smoking 1 Day or Longer in the Past Year among Michigan Residents by Age Group, 2010*



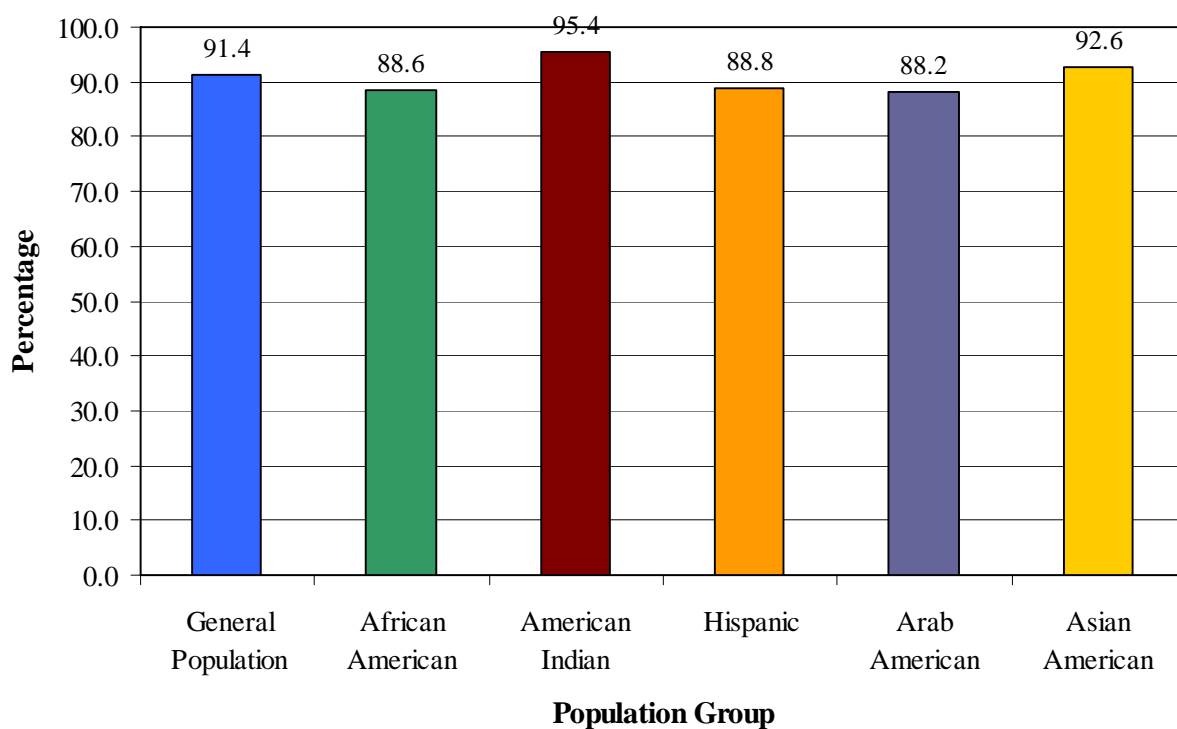
*Current smoking defined as having smoked 100 or more cigarettes in lifetime and smoke on some days now; stopped smoking for at least one day in attempt to quit; 2010 Michigan Behavioral Risk Factor Survey.

Figure 13: Percentage of Current Smokers Who Attempted to Quit Smoking in the Past Year among Michigan Residents Aged 40 Years or Older by Population Group, 2008*



*Current smoking defined as having smoked 100 or more cigarettes in lifetime and smoke on some days now; stopped smoking for at least one day in attempt to quit.

Figure 14: Current Smokers* Aged 40 Years or Older Whose Doctor Advised of Smoking Cessation Programs and Resources by Population Group, 2008



*Current smoking defined as having smoked 100 or more cigarettes in lifetime and smoke on some days now.

Table 5: HEDIS Measures* for Advising Smokers to Quit Tobacco Usage, MI vs. US 2003-2009

| | Michigan | National |
|------|----------|----------|
| 2003 | 72.6 | 67.7 |
| 2004 | 73.4 | 68.7 |
| 2005 | 74.0 | 69.6 |
| 2006 | 76.0 | 71.2 |
| 2007 | 78.9 | 73.8 |
| 2008 | 80.2 | 75.3 |
| 2009 | 79.9 | 75.2 |

* The HEDIS measure is the percentage of members 18 years of age and older who were current smokers, who were seen by a practitioner during the year and who received advice to quit smoking. Measures include all lines of business HMO, POS, PPO, HMO/POS combined, and HMO/POS/PPO combined. In 2006, recent quitters were removed from the denominator for this measure. Trending performance with prior years' data should be considered with caution.

Table 6: HEDIS Measures* for Discussing Medications for Smoking Cessation, MI vs. US 2005-2009

| | Michigan | National |
|------|----------|----------|
| 2005 | 41.2 | 37.8 |
| 2006 | 42.9 | 39.4 |
| 2007 | 50.1 | 43.9 |
| 2008 | 55.5 | 50.8 |
| 2009 | 57.6 | 53.4 |

* The HEDIS measure is the percentage of members 18 years of age and older who were current smokers and whose practitioner recommended or discussed smoking cessation medications. In 2006, recent quitters were removed from the denominator for this measure. Trending performance with prior years' data should be considered with caution. Measures include all lines of business HMO, POS, PPO, HMO/POS combined, and HMO/POS/PPO combined.

Table 7: HEDIS Measures* for Discussing Strategies for Smoking Cessation, MI
vs. US 2005-2009

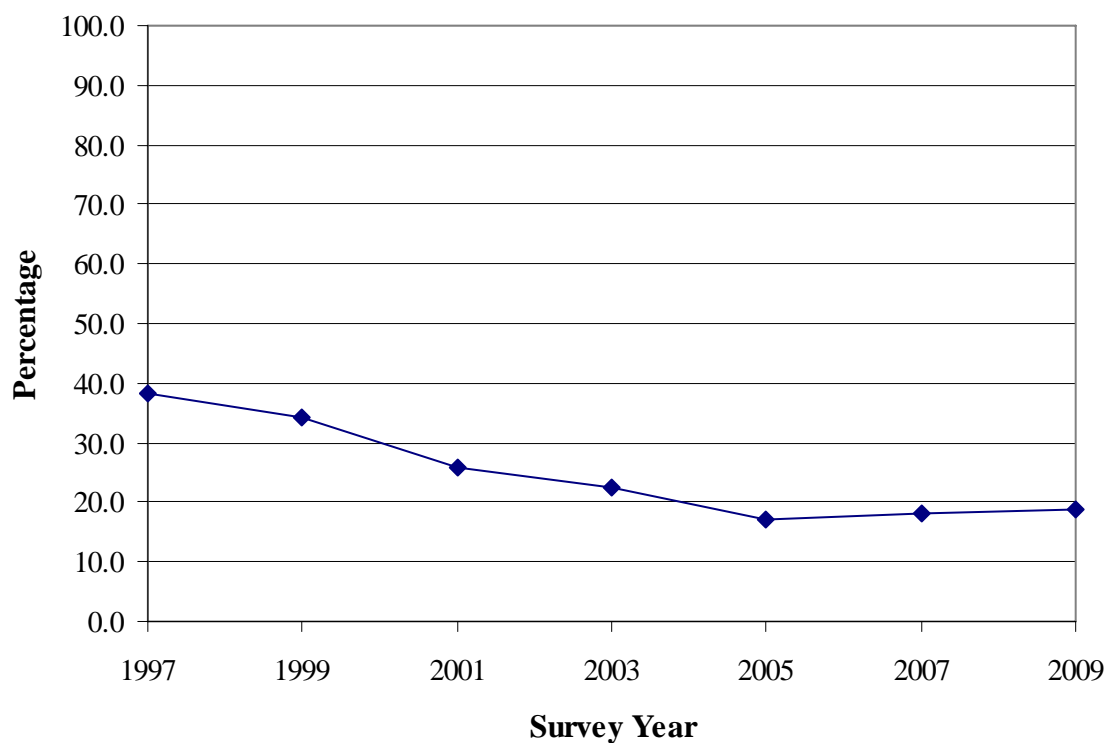
| | Michigan | National |
|------|----------|----------|
| 2005 | 39.8 | 36.9 |
| 2006 | 42.6 | 39.0 |
| 2007 | 47.6 | 43.2 |
| 2008 | 51.9 | 47.5 |
| 2009 | 55.5 | 47.9 |

*The HEDIS measure is the percentage of members 18 years of age and older who were current smokers and whose practitioner recommended or discussed smoking cessation methods or strategies. In 2006, recent quitters were removed from the denominator for this measure. Trending performance with prior years' data should be considered with caution. Measures include all lines of business HMO, POS, PPO, HMO/POS combined, and HMO/POS/PPO combined.

Table 8: Tobacco Use Indicators among Michigan Youth, 2009

| | Total | Gender | | Grades | | | | Race | |
|---|--------------|---------------|---------------|---------------|------------|------------|------------|--------------|--------------|
| | | Male | Female | 9 | 10 | 11 | 12 | White | Black |
| Behavior | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Percentage of students who ever tried cigarettes, even 1 or 2 puffs | 46.0 | 45.2 | 46.8 | 37.0 | 44.4 | 51.9 | 52.4 | 45.4 | 45.4 |
| Percentage of students who smoked a whole cigarette before age 13 | 11.1 | 11.6 | 10.3 | 11.9 | 10.8 | 12.3 | 8.7 | 9.7 | 14.5 |
| Percentage of students who smoked cigarettes on 1 or more of past 30 days | 18.8 | 18.4 | 19.1 | 14.8 | 16.5 | 21.4 | 23.4 | 19.9 | 11.0 |
| Percentage of students who smoked cigarettes on 20 or more of past 30 days | 7.8 | 7.1 | 8.5 | 5.5 | 6.1 | 9.2 | 11.1 | 8.3 | 4.1 |
| Of students who were <u>current smokers</u> , percentage tried to quit smoking in the past 12 months | 53.6 | 51.5 | 55.7 | 65.1 | 52.8 | 51.4 | 48.0 | 52.8 | - |
| Percentage of students who smoked cigars, cigarillos, or little cigars on 1 or more of past 30 days | 14.7 | 19.9 | 9.0 | 10.2 | 13.1 | 15.6 | 19.9 | 14.0 | 14.1 |
| <u>Current smokers</u> 18 years and less who purchased cigarettes at a store or gas station during the past 30 days | 15.2 | 21.2 | 9.7 | 6.8 | 8.0 | 21.3 | - | 14.5 | - |

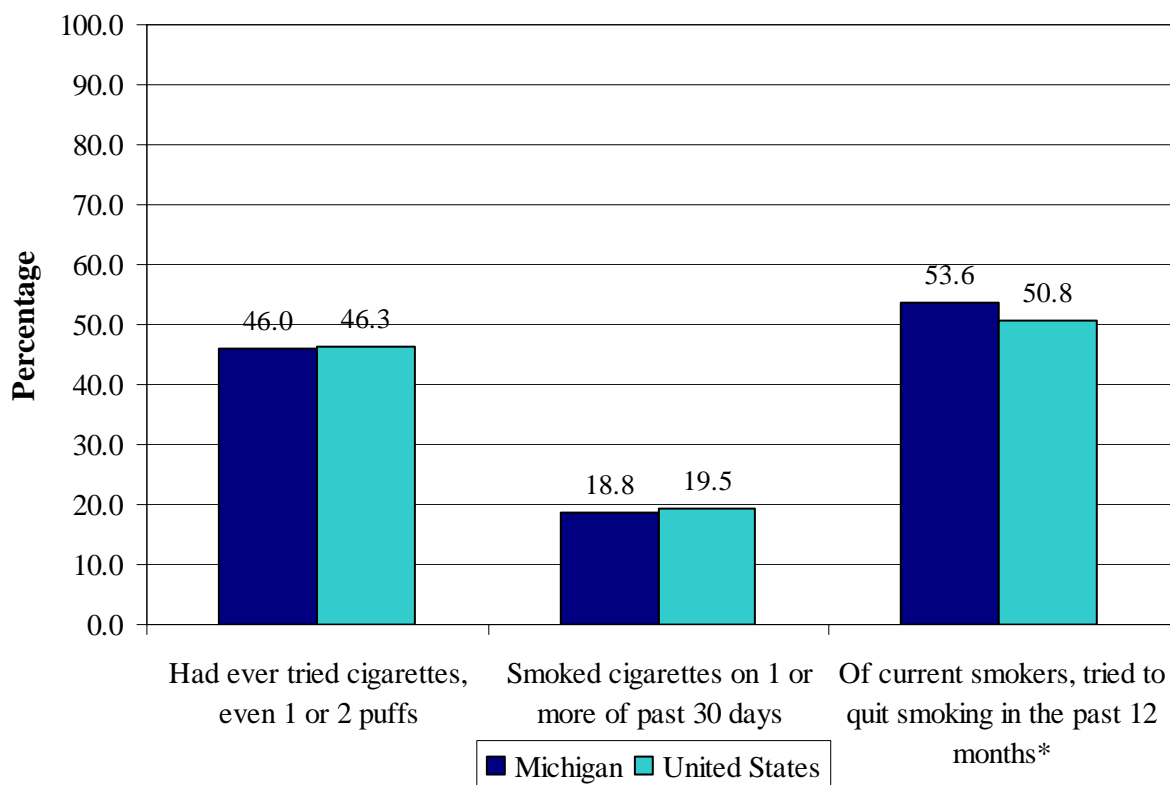
Figure 15: Percentage of Michigan Youth Grades 9-12 Who Are Current Smokers, 1997-2009



| Year | Current Smokers ¹ (%) |
|------|-------------------------------------|
| 1997 | 38.2 |
| 1999 | 34.1 |
| 2001 | 25.7 |
| 2003 | 22.6 |
| 2005 | 17.0 |
| 2007 | 18.0 |
| 2009 | 18.8 |

¹Current smoking defined as having smoked cigarettes on one or more days in the past 30 days.

Figure 16: Tobacco Use Indicators among Youth Grades 9-12, MI vs. US, 2009



*Difference is statistically significant at $p < 0.05$.

Prostate Cancer

Figure 17: Percentage of Men Aged 40 Years or Older Who Ever Had a Prostate Specific Antigen (PSA) Test by Population Group, 2008

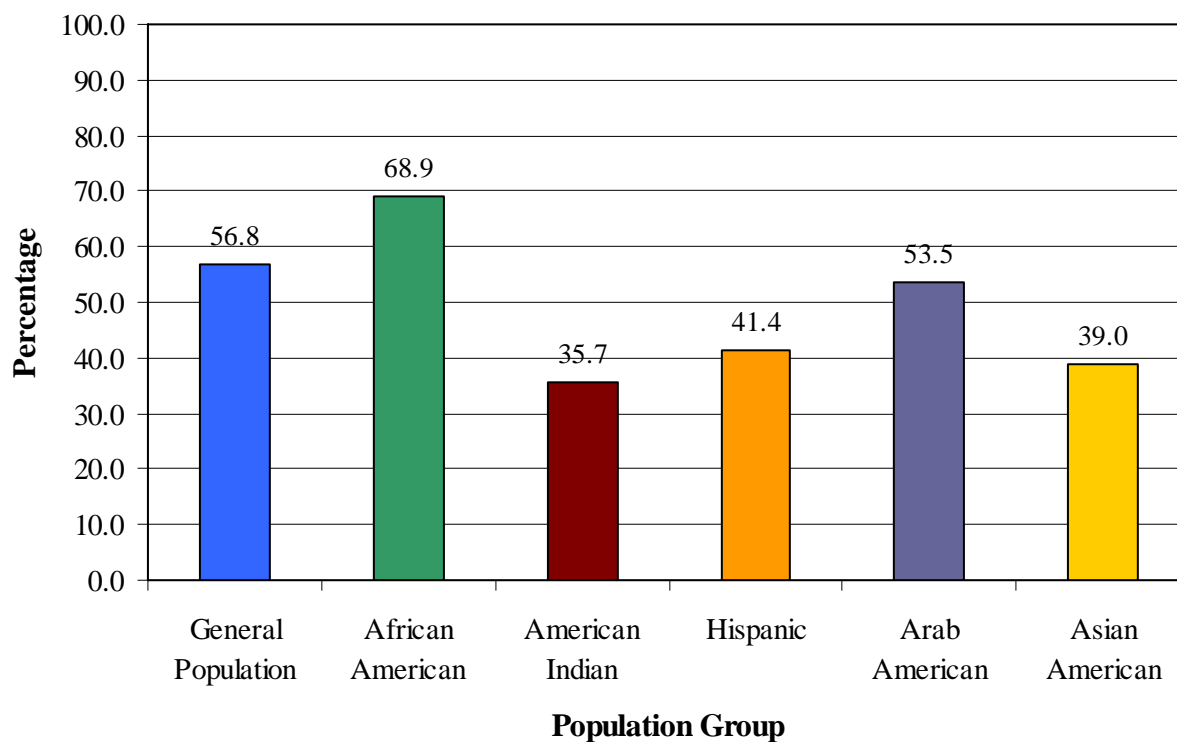
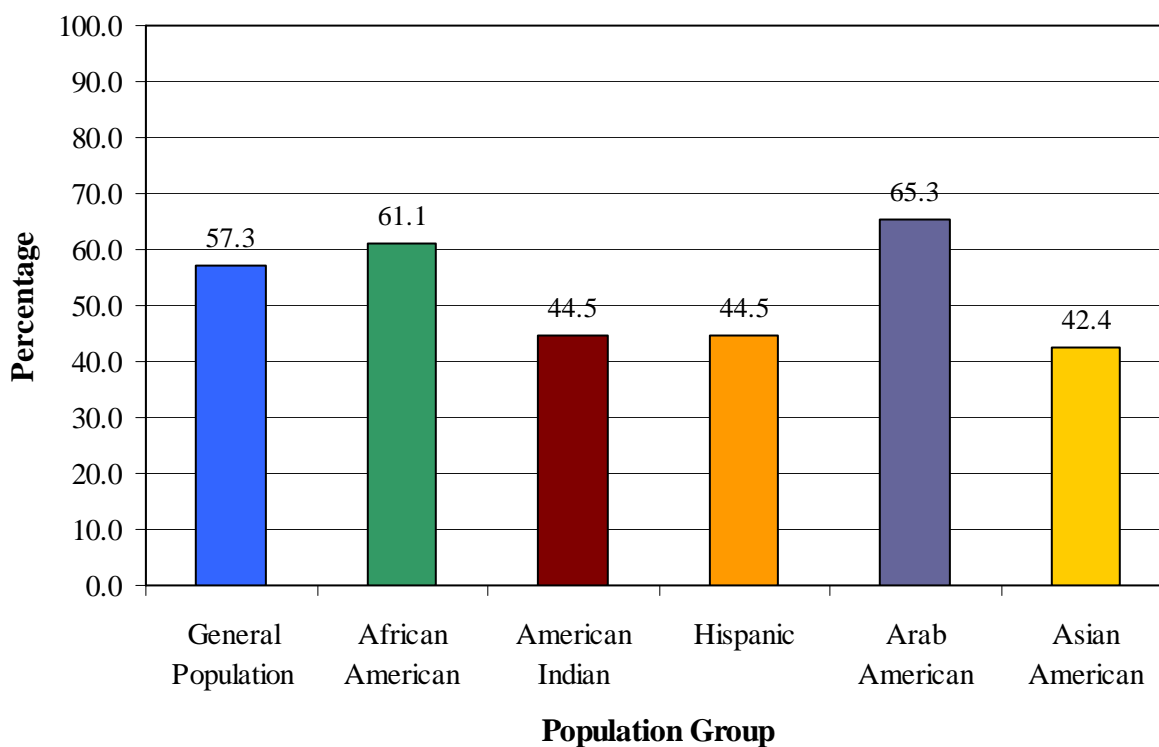


Figure 18: Percentage of Men Aged 40 Years or Older Who Ever Discussed Prostate Specific Antigen (PSA) Testing with Their Doctor by Population Group, 2008



Human Cost

Table of Contents

| | |
|--|----------|
| Background | 2 |
| Summary..... | 2 |
| Human Cost..... | 4 |
| Figure 1: Total Person-Years of Life Lost due to Cancer by Cancer Site, Michigan 2008..... | 4 |
| Figure 2: Total Person-Years of Life Lost due to Cancer Michigan, 1994-2008..... | 5 |
| Figure 3: Average Years of Life Lost due to Cancer, Michigan 1994-2008..... | 6 |
| Figure 4: Average Years of Life Lost by Cancer Site, Michigan 2008 vs. US 2007 | 7 |
| Figure 5: Average Years of Life Lost by Cancer Site and Race, Michigan 2008 | 8 |

Background

Mortality and survival rates give a partial picture of the burden of cancer deaths in a population. Years of life lost (YLL) due to premature death from cancer were calculated to further assess the burden of disease. The person-years of life lost (PYLL) is the sum of the difference between the actual age at death and the expected remaining lifetime for each person who died of cancer. This measure was estimated by linking life table data to each death of a person of a given age and sex. The life table is used to determine the number of additional years an average person of that age, race, and sex would be expected to live. The average years of life lost (AYLL) is a measure of the burden of cancer to the individual patient. The AYLL was obtained by dividing the PYLL by the number of cancer deaths.

For this report, PYLL and AYLL estimates for 2008 were produced using 2006 United States Life Tables, from the Centers for Disease Control and Prevention's National Center for Health Statistics US mortality files.^{1,2} The age groups used in the calculation were 1-year intervals. Average years of life lost were compared between blacks and whites for each cancer site. SEER estimates of AYLL for the United States were compared to estimates of Michigan's AYLL.³

Summary

Figure 1 shows the total number of person-years of life lost by cancer site in Michigan in 2008. The greatest number of person-years of life lost was due to lung cancer, which caused 91,319 total person-years. Colorectal cancer accounted for 26,568 total person-years of life lost and breast cancer accounted for 27,898 person-years of life lost. Prostate cancer cost 8,932 total years of life, ovarian cancer accounted for 8,427 total years of life, and cervical cancer was responsible for 3,020 person-years of life lost.

Figure 2 presents the total number of person-years of life lost by cancer site over time from 1994 to 2008. The total person-years of life lost has not changed drastically since 1994 for colorectal, breast, cervical, and prostate cancer. The total person-years of life lost from lung cancer did decrease in 2008 after gradually increasing since 1994.

Figure 3 shows average years of life lost by cancer site from 1994 to 2008. The greatest number of average years of life lost was due to cervical cancer, which decreased in 2008 after increasing in the previous four years. Breast cancer accounted for the second greatest number of average years of life lost, followed by lung cancer, colorectal cancer, and prostate cancer.

¹ National Center for Health Statistics. (2010). *United States Life Tables, 2006*; National Vital Statistics Reports; Vol 58 No 21. Retrieved at: http://www.cdc.gov/nchs/products/life_tables.htm.

² The 2006 Life Tables are the most recent year publicly available. The Life Tables for years 1997-2006 show expected years of life remaining for ages zero to 100. Life Tables for years 1985-1996 show expected years of life remaining for ages zero to 85. In order to calculate years of life lost prior to 1997, the years remaining in the 1997 Life Table for ages 86 to 100 years were used to estimate the years remaining for the 1985-1996 calculations.

³ National Cancer Institute. (2011). *SEER Cancer Statistics Review, 1975-2008*. Retrieved from: www.seer.cancer.gov/csr/1975_2008/index.html

Figure 4 presents the average years of life lost in Michigan in 2008 compared with the average years of life lost in the United States in 2007. The average numbers of years of life lost in Michigan were similar to those in the U.S. SEER estimates at each of the selected cancer sites. Although cervical cancer caused the fewest person-years of life to be lost in the total population cumulatively, it had the greatest average number of years of life lost among the six cancer sites. Breast cancer had the next highest average cost in years of life lost, followed by ovarian, lung, colorectal, and prostate cancer.

Figure 5 presents the average years of life lost by cancer site and race in Michigan in 2008. Compared to whites, blacks had a greater average of years of life lost for all the cancer sites. The greatest disparity between whites and blacks is from cervical cancer and the smallest disparity between whites and black in average years of life lost was from prostate cancer.

Other than years of life lost, estimates of the human costs of cancer are scant. Morbidity indicators for the cancer patient, such as loss of work or school time and periods of restricted activity due to the disease are difficult to measure. In addition, there are significant human and financial costs to family members and other caregivers who give up activities, opportunities, and income to provide assistance to cancer patients. To date, no such data have been identified for the cancers of interest.

Human Cost

Figure 1: Total Person-Years of Life Lost due to Cancer by Cancer Site, Michigan 2008

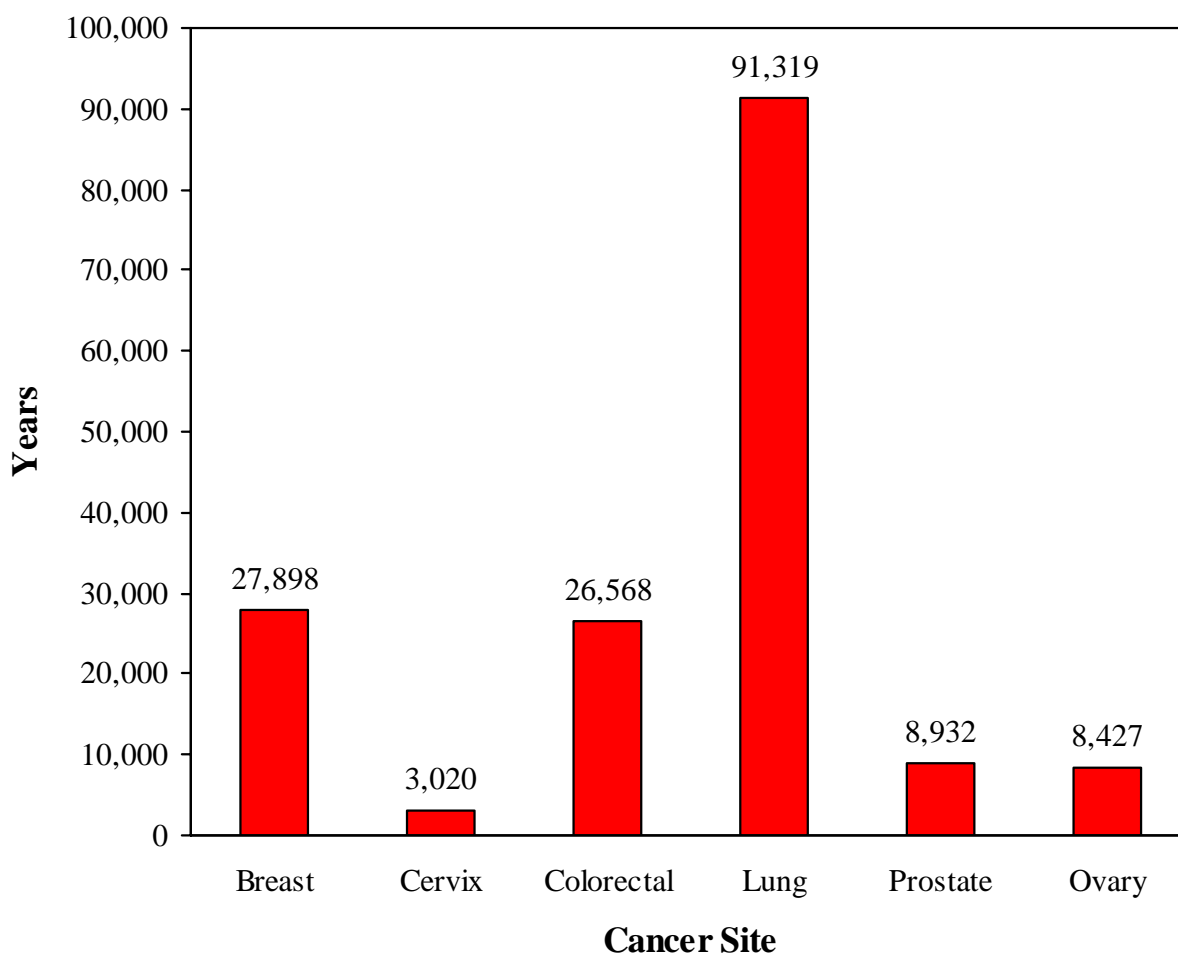


Figure 2: Total Person-Years of Life Lost due to Cancer Michigan, 1994-2008

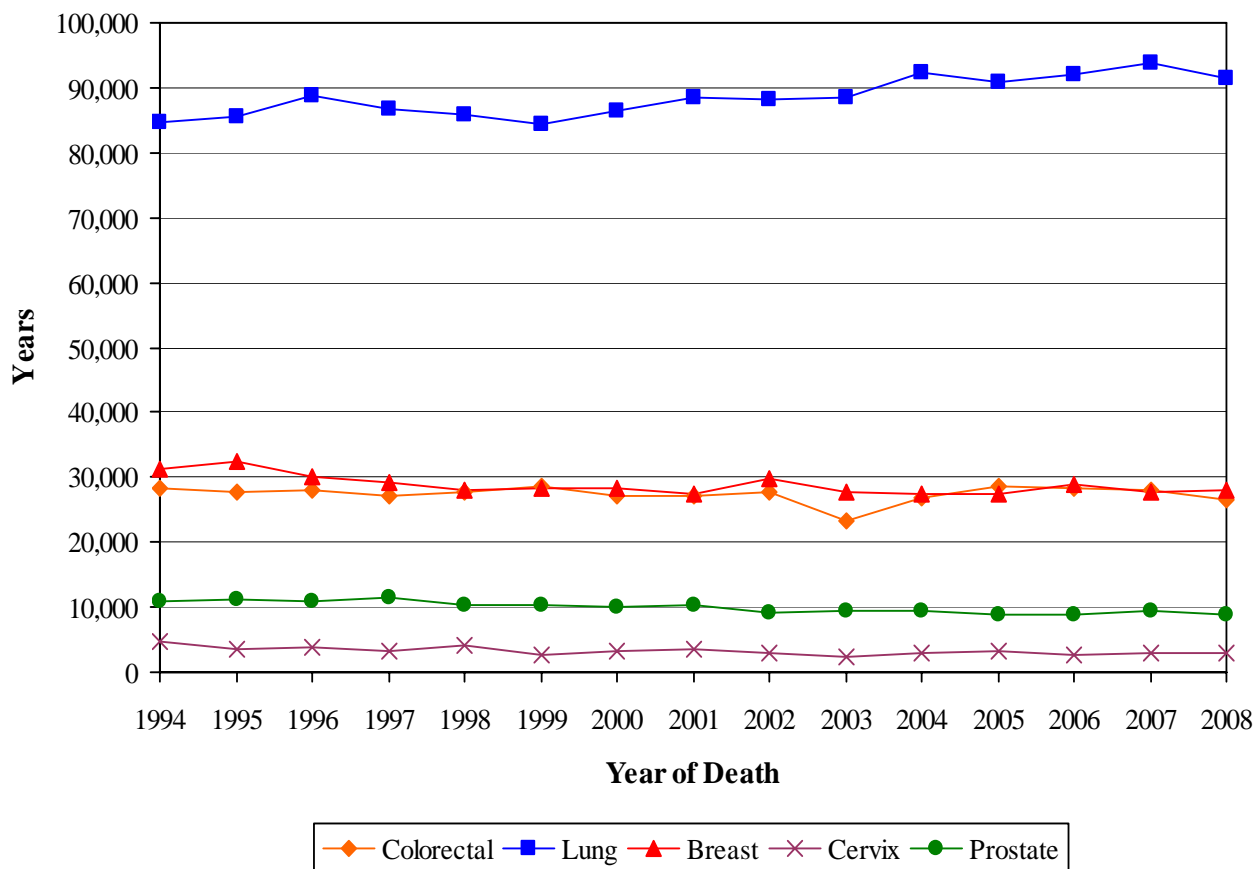


Figure 3: Average Years of Life Lost due to Cancer, Michigan 1994-2008

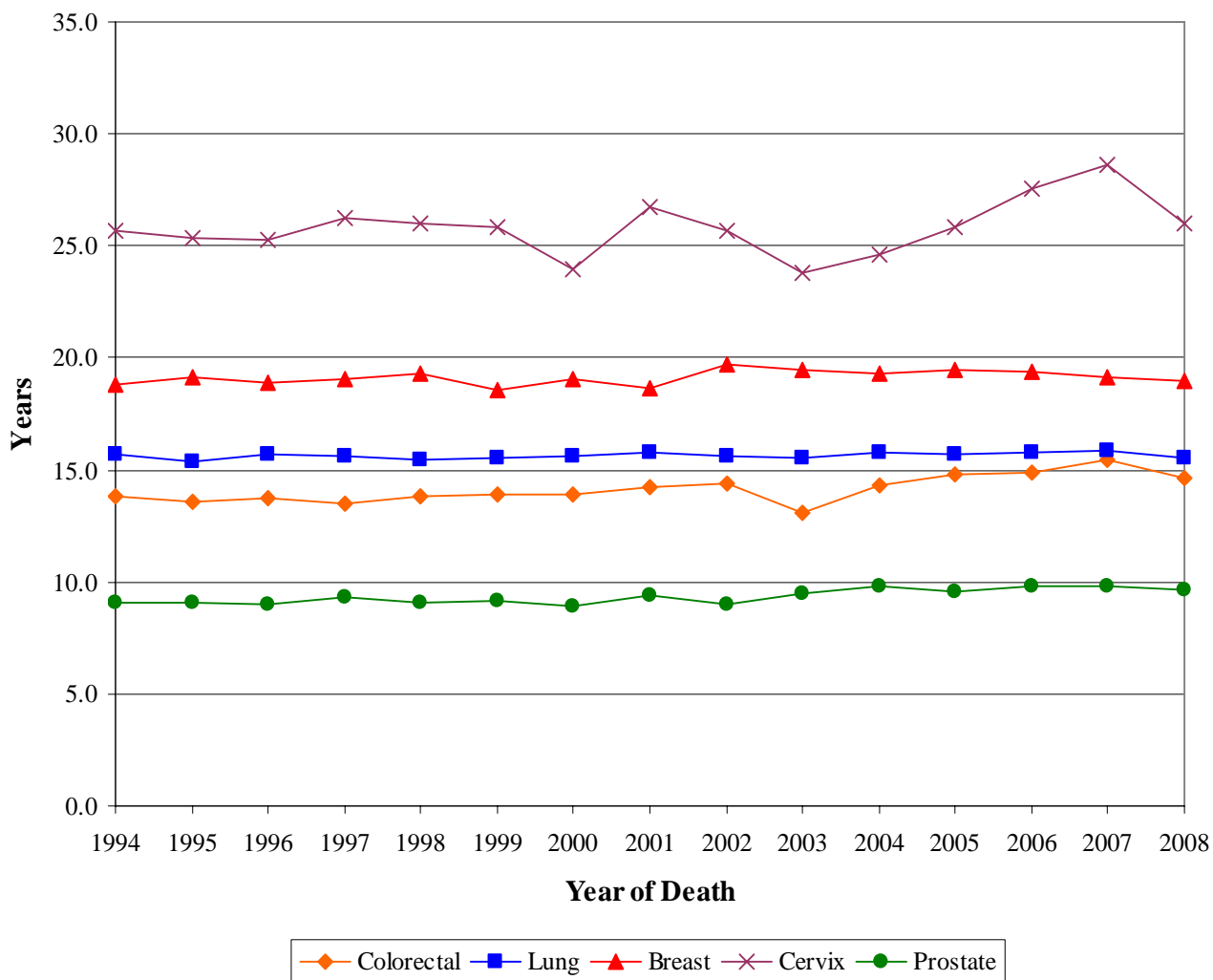


Figure 4: Average Years of Life Lost by Cancer Site, Michigan 2008 vs. US 2007

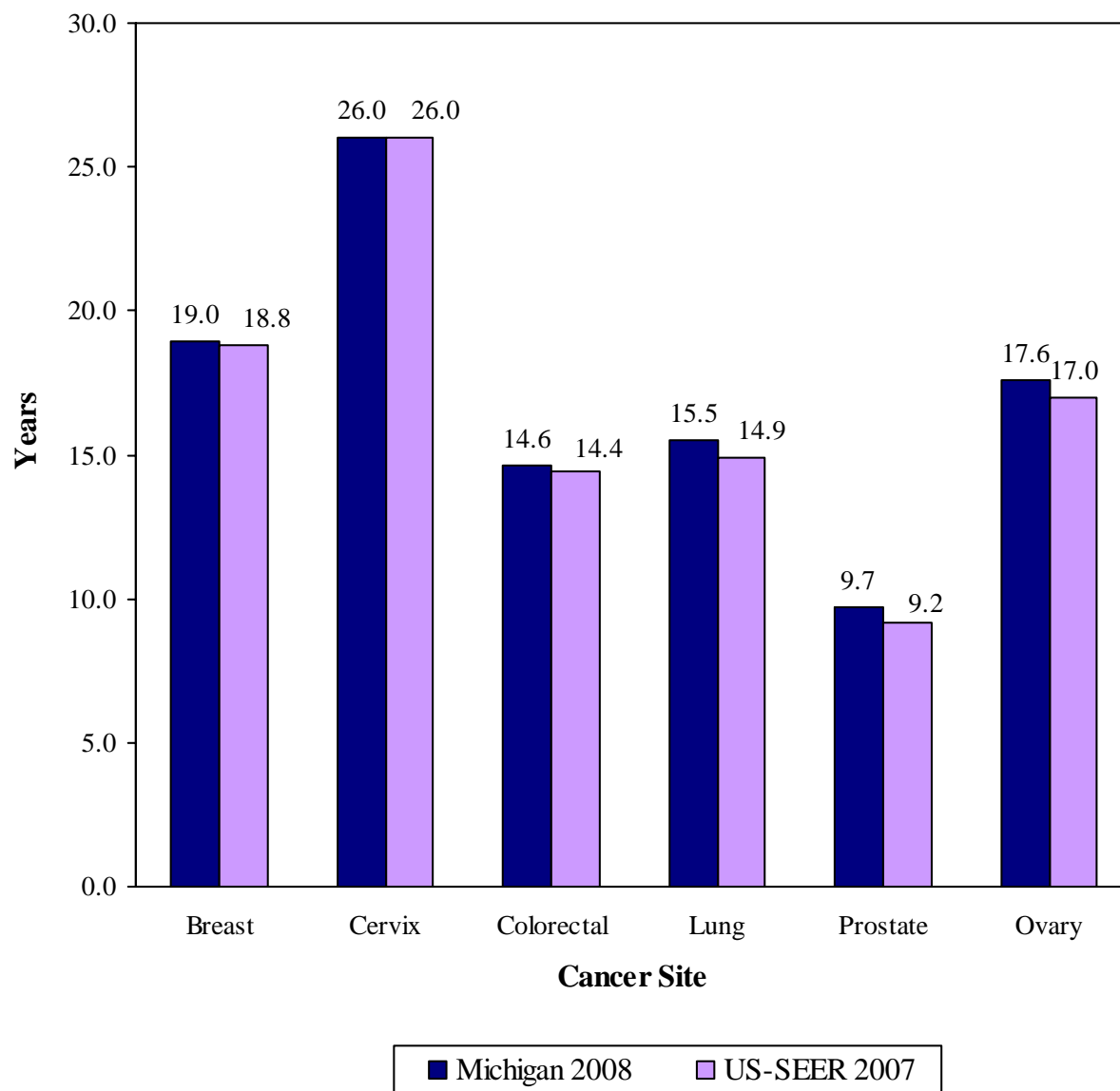
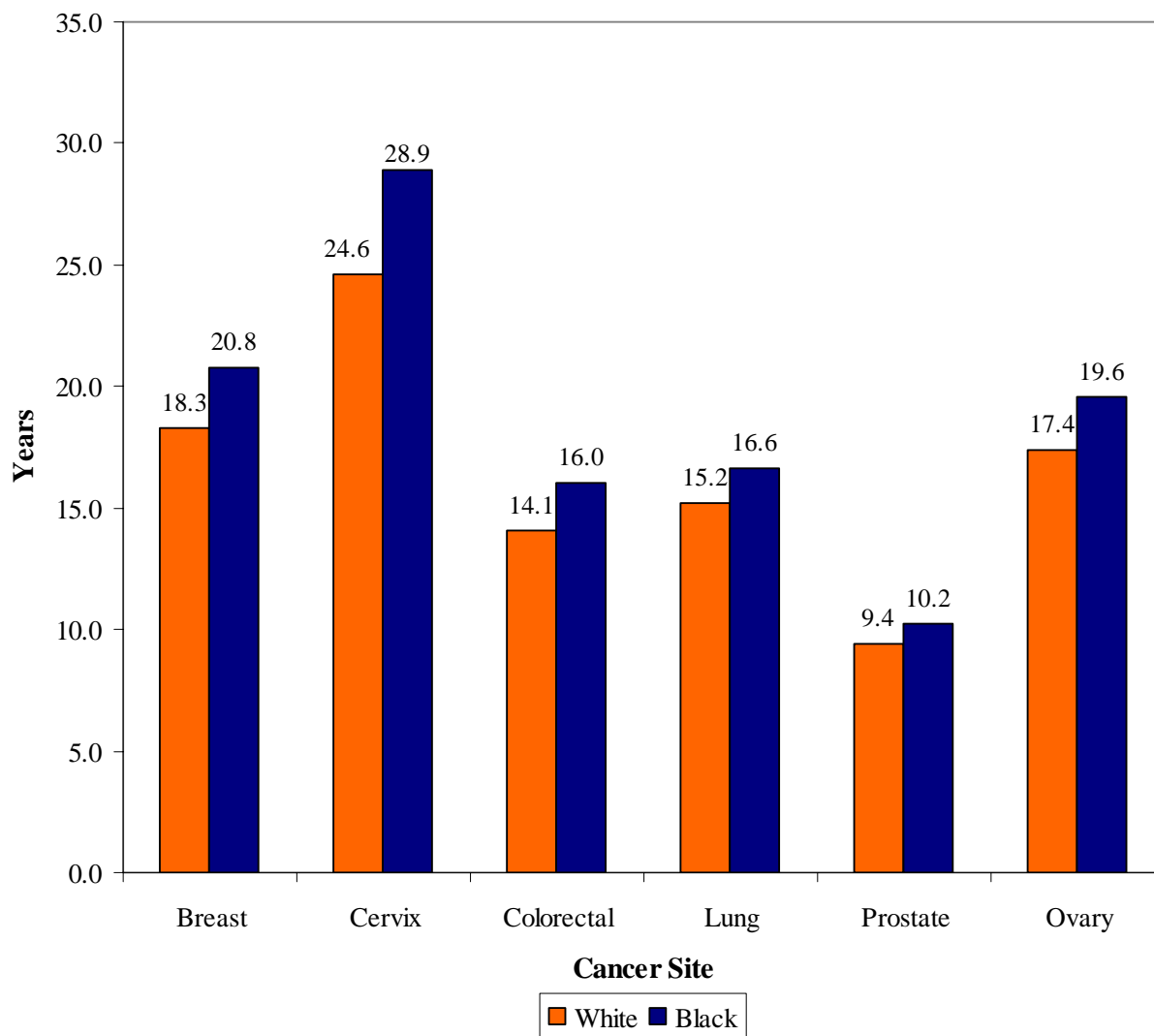


Figure 5: Average Years of Life Lost by Cancer Site and Race, Michigan 2008



Appendix I

Additional Resources for Cancer Statistics

The following resources provide additional statistics for cancer researchers:

American Cancer Society (ACS) Statistics

The American Cancer Society Statistics tracks cancer occurrence, including the number of deaths, cases, and how long people survive after diagnosis. ACS also tracks data regarding behaviors that influence the risk of developing cancer and the use of screening tests.

www.cancer.org/Research/CancerFactsFigures/index

Cancer Control P.L.A.N.E.T.

The Cancer Control P.L.A.N.E.T. portal provides access to Web-based resources that can assist in assessing the cancer and/or risk factor burden within a given state, identifying potential partner organizations that may already be working with high-risk populations, understanding the current research findings and recommendations, accessing and downloading evidence-based programs and products, finding guidelines for planning and evaluation.

www.cancercontrolplanet.cancer.gov

Cancer Trends Progress Report

The *Cancer Trends Progress Report* summarizes the nation's progress against cancer in relation to Healthy People 2010 targets set forth by the Department of Health and Human Services. The report includes key measures of progress along the cancer control continuum and uses national trend data to illustrate where advances have been made.

www.progressreport.cancer.gov/

CINA + Cancer Inquiry System

The CINA+ Cancer Inquiry System provides data collected by the North American Association of Central Cancer Registries (NAACCR), data from state and provincial cancer registries participating in SEER, the National Program of Cancer Registries (NPCR), or both, in the US and the Canadian Cancer Registry in Canada, on cancer incidence rates for North America with an interactive website that generates customizable cancer incidence data and creates maps corresponding to the customized data search.

www.cancer-rates.info/naaccr/

Interactive Cancer Atlas

The Interactive Cancer Atlas uses data from *United States Cancer Statistics (USCS)* to create United States maps that allow you to make quick comparisons.

www.cdc.gov/Features/CancerAtlas/

Karmanos Metropolitan Detroit Cancer Surveillance System (MDCSS)

The MDCSS provides statistics on cancer incidence, mortality, and survival for persons with cancer in the Detroit Metropolitan area of Michigan.

www.karmanos.org/epid/

Michigan Behavioral Risk Factor Survey (BRFS)

The Michigan BRFS provides surveillance data focusing on health-risk behaviors, health indicators, and chronic diseases at the state level.

www.michigan.gov/mdch/0,1607,7-132-2945_5104_5279_39424---,00.html

Michigan Cancer Surveillance Program

The Michigan Cancer Surveillance Program provides statistics on cancer incidence, mortality, and survival for persons with cancer in the state of Michigan and some selected counties of Michigan.

www.michigan.gov/mdch/0,1607,7-132-2944_5323---,00.html

National Behavioral Risk Factor Surveillance System (BRFSS)

The National BRFSS provides surveillance data focusing on health-risk behaviors, health indicators, and chronic diseases at the National level as well as for all 50 states, the District of Columbia, Puerto Rico, Guam, and the U.S. Virgin Islands.

www.cdc.gov/brfss/

SEER – Cancer Statistics Review (CSR)

The SEER CSR is an annual report containing the most recent incidence, mortality, and survival statistics, published by the Cancer Statistics Branch of the National Cancer Institute (NCI). It presents a broad profile of the cancer burden.

www.seer.cancer.gov

SMART: Behavioral Risk Factor Surveillance System (BRFS) City and County Data

The SMART BRFS uses the Behavioral Risk Factor Surveillance System (BRFSS) to analyze the data of selected metropolitan and micropolitan statistical areas (MMSAs) with

500 or more respondents. The SMART BRFS provides surveillance data focusing on health-risk behaviors, health indicators, and chronic diseases at the local level.

<http://apps.nccd.cdc.gov/brfss-smart/index.asp>

Special Cancer Risk Factor Survey (SCBRFS)

The SCBRFS provides surveillance data focusing on health-risk behaviors among special populations in Michigan and includes data for African American, Arab American, American Indian, Hispanic, and Asian American populations.

www.michigancancer.org/PDFs/MCCReports/SCBRFS_2008-042910.pdf

Youth Risk Behavioral Surveillance System (YRBSS)

The YRBSS monitors priority health-risk behaviors and the prevalence of obesity and asthma among youth and young adults.

www.cdc.gov/HealthyYouth/yrbs/index.htm

Appendix II

Table of Contents

| | |
|--|----|
| Table 1: Breast, Cervical, Colorectal, Lung, Prostate and Ovarian Cancer Mortality Rates by County, Michigan 1999-2008..... | 2 |
| Table 2: Breast, Cervical, Colorectal, Lung, Prostate, and Ovarian Cancer Incidence Rates by County, Michigan 1998-2007..... | 4 |
| Table 3: Percentage of Breast Cancer Cases Localized at Diagnosis by County, 1995-1997 and 2005-2007..... | 6 |
| Table 4: Percentage of Cervical Cancer Cases In-situ at Diagnosis by County, 1995-1997 and 2005-2007..... | 8 |
| Table 5: Percentage of Colorectal Cancer Cases Localized at Diagnosis by County, 1995-1997 and 2005-2007..... | 10 |
| Table 6: Percentage of Lung Cancer Cases Localized at Diagnosis by County, 1995-1997 and 2005-2007..... | 12 |
| Table 7: Percentage of Prostate Cancer Cases Localized at Diagnosis by County, 1995-1997 and 2005-2007..... | 14 |
| Table 8: Percentage of Ovarian Cancer Cases Localized at Diagnosis by County, 1995-1997 and 2005-2007..... | 16 |

**Table 1: Breast, Cervical, Colorectal, Lung, Prostate and Ovarian Cancer
Mortality Rates by County, Michigan 1999-2008**

| County | Breast | Cervical | Colorectal | Lung | Prostate | Ovarian |
|------------|-------------|------------|------------|-------------|-------------|------------|
| Alcona | 20.3 ± 10.4 | 1.5 ± 3.0 | 13.1 ± 4.7 | 57.1 ± 9.5 | 20.6 ± 6.8 | 8.4 ± 5.2 |
| Alger | 20.6 ± 9.6 | 0.0 ± 0.0 | 17.7 ± 6.7 | 60.4 ± 12.6 | 31.4 ± 13.0 | 6.3 ± 6.2 |
| Allegan | 21.7 ± 3.6 | 2.0 ± 1.2 | 19.4 ± 2.4 | 51.3 ± 4.1 | 32.8 ± 4.1 | 12.6 ± 2.7 |
| Alpena | 24.5 ± 6.7 | 0.9 ± 1.3 | 18.8 ± 3.9 | 52.5 ± 6.8 | 21.3 ± 5.3 | 10.4 ± 4.1 |
| Antrim | 32.3 ± 8.8 | 1.1 ± 1.1 | 15.8 ± 4.0 | 52.9 ± 7.4 | 28.7 ± 6.6 | 7.0 ± 3.9 |
| Arenac | 17.0 ± 7.9 | 4.3 ± 4.9 | 19.4 ± 5.1 | 57.3 ± 9.5 | 30.0 ± 8.0 | 8.1 ± 4.5 |
| Baraga | 27.8 ± 11.9 | 1.8 ± 3.5 | 11.6 ± 6.1 | 60.9 ± 14.3 | 26.4 ± 9.8 | 1.7 ± 3.3 |
| Barry | 22.0 ± 4.8 | 1.6 ± 1.4 | 21.4 ± 3.1 | 55.8 ± 5.7 | 32.1 ± 5.8 | 13.8 ± 3.8 |
| Bay | 21.8 ± 3.3 | 1.8 ± 1.1 | 18.4 ± 2.2 | 62.7 ± 4.2 | 22.4 ± 3.1 | 10.8 ± 2.3 |
| Benzie | 16.3 ± 7.1 | 1.0 ± 1.9 | 16.8 ± 4.5 | 52.5 ± 9.0 | 20.4 ± 6.5 | 11.4 ± 6.0 |
| Berrien | 24.1 ± 2.9 | 3.1 ± 1.1 | 16.7 ± 1.7 | 59.0 ± 3.3 | 21.4 ± 2.7 | 8.5 ± 1.8 |
| Branch | 24.7 ± 5.6 | 2.4 ± 1.9 | 18.7 ± 3.5 | 60.7 ± 6.6 | 25.7 ± 5.9 | 8.2 ± 3.3 |
| Calhoun | 27.2 ± 3.3 | 1.9 ± 1.0 | 18.4 ± 1.9 | 60.9 ± 3.8 | 30.8 ± 3.5 | 8.1 ± 1.9 |
| Cass | 29.9 ± 5.5 | 2.4 ± 1.7 | 21.0 ± 3.4 | 65.6 ± 6.2 | 26.7 ± 5.3 | 11.5 ± 3.6 |
| Charlevoix | 21.5 ± 6.7 | 2.9 ± 2.5 | 15.1 ± 3.6 | 53.6 ± 7.6 | 31.0 ± 6.9 | 9.7 ± 4.5 |
| Cheboygan | 28.8 ± 7.2 | 4.3 ± 3.5 | 16.8 ± 3.9 | 56.4 ± 7.1 | 24.9 ± 5.8 | 10.4 ± 4.1 |
| Chippewa | 17.3 ± 5.0 | 3.1 ± 2.5 | 18.7 ± 3.8 | 55.9 ± 7.0 | 15.1 ± 4.3 | 12.5 ± 4.7 |
| Clare | 24.6 ± 6.5 | 1.7 ± 1.8 | 16.1 ± 3.3 | 78.2 ± 8.1 | 25.3 ± 5.5 | 11.6 ± 4.5 |
| Clinton | 21.7 ± 4.7 | 0.9 ± 0.9 | 19.8 ± 3.2 | 40.4 ± 4.9 | 27.0 ± 5.0 | 9.6 ± 3.2 |
| Crawford | 21.3 ± 8.9 | 3.1 ± 3.6 | 20.7 ± 6.3 | 62.0 ± 10.8 | 22.5 ± 7.9 | 12.0 ± 6.6 |
| Delta | 27.3 ± 6.0 | 3.0 ± 2.3 | 18.3 ± 3.3 | 51.8 ± 6.1 | 26.4 ± 5.7 | 8.6 ± 3.4 |
| Dickinson | 17.4 ± 5.8 | 1.3 ± 1.8 | 18.8 ± 4.0 | 44.5 ± 6.6 | 23.2 ± 6.1 | 9.5 ± 4.2 |
| Eaton | 23.2 ± 3.7 | 1.4 ± 0.9 | 16.3 ± 2.2 | 47.9 ± 4.0 | 27.5 ± 3.9 | 8.9 ± 2.3 |
| Emmet | 20.2 ± 6.0 | 1.9 ± 2.2 | 15.7 ± 3.7 | 54.2 ± 7.0 | 20.5 ± 6.1 | 11.3 ± 4.4 |
| Genesee | 29.0 ± 2.0 | 2.5 ± 0.6 | 20.5 ± 1.2 | 64.7 ± 2.3 | 25.9 ± 1.9 | 10.3 ± 1.2 |
| Gladwin | 21.0 ± 6.5 | 3.6 ± 3.3 | 19.0 ± 3.8 | 65.5 ± 7.8 | 19.9 ± 4.9 | 10.7 ± 4.5 |
| Gogebic | 28.5 ± 8.8 | 5.2 ± 5.0 | 20.6 ± 5.1 | 54.1 ± 8.7 | 30.2 ± 7.6 | 8.9 ± 5.4 |
| Grand | 20.0 ± 3.8 | 1.0 ± 0.9 | 15.1 ± 2.3 | 45.9 ± 4.3 | 29.4 ± 4.1 | 8.6 ± 2.5 |
| Gratiot | 20.9 ± 5.8 | 3.1 ± 2.3 | 23.8 ± 4.2 | 47.0 ± 6.2 | 22.6 ± 5.1 | 10.8 ± 4.0 |
| Hillsdale | 27.8 ± 5.9 | 1.1 ± 1.2 | 20.7 ± 3.6 | 53.3 ± 6.0 | 22.5 ± 5.5 | 8.7 ± 3.4 |
| Houghton | 25.3 ± 6.8 | 2.8 ± 2.6 | 17.4 ± 3.7 | 52.3 ± 7.0 | 32.4 ± 6.1 | 6.1 ± 3.2 |
| Huron | 24.5 ± 6.1 | 1.1 ± 1.5 | 22.8 ± 3.8 | 47.9 ± 5.7 | 24.2 ± 4.9 | 8.9 ± 3.5 |
| Ingham | 22.9 ± 2.5 | 1.7 ± 0.7 | 16.0 ± 1.5 | 47.8 ± 2.7 | 21.8 ± 2.5 | 9.5 ± 1.6 |
| Ionia | 23.5 ± 5.3 | 1.4 ± 1.4 | 18.3 ± 3.3 | 55.1 ± 6.1 | 22.7 ± 5.5 | 6.3 ± 2.8 |
| Iosco | 22.3 ± 6.5 | 2.5 ± 2.5 | 17.9 ± 3.7 | 62.8 ± 7.1 | 22.3 ± 5.2 | 11.3 ± 4.7 |
| Iron | 24.6 ± 10.8 | 0.0 ± 0.0 | 19.3 ± 5.8 | 62.8 ± 10.7 | 20.8 ± 6.8 | 4.5 ± 3.3 |
| Isabella | 21.6 ± 5.4 | 3.8 ± 2.3 | 19.9 ± 3.6 | 60.4 ± 6.5 | 19.6 ± 5.0 | 9.9 ± 3.6 |
| Jackson | 25.9 ± 3.1 | 1.7 ± 0.9 | 18.5 ± 1.8 | 65.4 ± 3.7 | 30.2 ± 3.2 | 8.9 ± 1.8 |
| Kalamazoo | 25.0 ± 2.7 | 1.9 ± 0.8 | 16.6 ± 1.5 | 54.3 ± 2.9 | 26.0 ± 2.7 | 9.2 ± 1.6 |
| Kalkaska | 19.0 ± 8.3 | 0.0 ± 0.0 | 24.6 ± 6.3 | 64.7 ± 10.7 | 19.8 ± 7.1 | 11.7 ± 7.0 |
| Kent | 23.0 ± 1.7 | 1.3 ± 0.4 | 16.6 ± 1.0 | 48.2 ± 1.8 | 24.5 ± 1.7 | 7.8 ± 1.0 |
| Keweenaw | 14.3 ± 16.0 | 5.9 ± 11.5 | 10.2 ± 9.0 | 48.2 ± 19.3 | 12.2 ± 12.1 | 4.5 ± 8.7 |

* Age-adjusted rate per 100,000 population computed by gender for breast, cervical and prostate cancer.

Appendix II

Mortality Rates by County

| County | Breast | Cervical | Colorectal | Lung | Prostate | Ovarian |
|------------|-------------|-----------|------------|-------------|-------------|-------------|
| Lake | 25.3 ± 10.8 | 3.7 ± 5.6 | 26.4 ± 6.6 | 73.7 ± 12.4 | 18.0 ± 6.9 | 10.0 ± 6.6 |
| Lapeer | 27.2 ± 4.5 | 2.1 ± 1.3 | 20.8 ± 2.8 | 53.3 ± 4.9 | 27.6 ± 4.7 | 11.7 ± 3.0 |
| Leelanau | 19.8 ± 7.4 | 0.6 ± 0.0 | 14.3 ± 3.7 | 35.0 ± 6.3 | 23.8 ± 5.8 | 5.8 ± 3.6 |
| Lenawee | 22.5 ± 3.7 | 2.7 ± 1.4 | 18.8 ± 2.4 | 53.7 ± 4.2 | 31.5 ± 4.0 | 9.1 ± 2.4 |
| Livingsto | 25.3 ± 3.4 | 1.3 ± 0.8 | 19.4 ± 2.1 | 52.3 ± 3.6 | 23.2 ± 3.0 | 7.8 ± 1.9 |
| Luce | 8.2 ± 9.6 | 2.3 ± 4.5 | 22.3 ± 9.6 | 55.9 ± 16.0 | 31.3 ± 13.6 | 15.8 ± 11.7 |
| Mackinac | 33.3 ± 12.0 | 1.1 ± 2.1 | 21.9 ± 6.3 | 73.7 ± 12.3 | 18.2 ± 7.6 | 9.4 ± 6.3 |
| Macomb | 28.3 ± 1.4 | 2.0 ± 0.4 | 19.2 ± 0.8 | 58.1 ± 1.5 | 23.6 ± 1.3 | 10.0 ± 0.8 |
| Manistee | 21.9 ± 6.8 | 0.0 ± 0.0 | 21.4 ± 4.3 | 56.3 ± 7.6 | 21.9 ± 6.3 | 9.4 ± 4.2 |
| Marquett | 21.7 ± 4.5 | 0.8 ± 0.9 | 15.2 ± 2.5 | 55.5 ± 5.2 | 21.8 ± 4.2 | 8.5 ± 2.9 |
| Mason | 22.9 ± 6.2 | 1.6 ± 1.8 | 19.1 ± 3.9 | 61.6 ± 7.4 | 22.8 ± 5.4 | 9.6 ± 4.2 |
| Mecosta | 18.7 ± 5.1 | 0.0 ± 0.0 | 19.3 ± 3.7 | 56.7 ± 6.7 | 20.0 ± 4.5 | 6.6 ± 3.4 |
| Menomin | 23.8 ± 6.7 | 0.0 ± 0.0 | 12.7 ± 3.5 | 53.5 ± 7.5 | 16.9 ± 5.4 | 12.4 ± 5.4 |
| Midland | 22.0 ± 4.0 | 2.0 ± 1.1 | 17.2 ± 2.5 | 51.5 ± 4.5 | 20.9 ± 3.7 | 8.8 ± 2.5 |
| Missauke | 22.9 ± 9.1 | 2.6 ± 3.6 | 20.4 ± 5.8 | 62.7 ± 11.1 | 15.6 ± 7.5 | 14.4 ± 7.0 |
| Monroe | 22.1 ± 3.1 | 2.0 ± 1.0 | 20.7 ± 2.1 | 57.6 ± 3.7 | 27.2 ± 3.4 | 11.3 ± 2.3 |
| Montcalm | 25.3 ± 5.3 | 3.8 ± 2.2 | 19.5 ± 3.0 | 60.7 ± 5.9 | 26.5 ± 5.0 | 5.0 ± 2.4 |
| Montmor | 20.7 ± 10.6 | 5.2 ± 6.3 | 18.3 ± 6.1 | 63.7 ± 11.5 | 23.1 ± 7.6 | 9.3 ± 6.0 |
| Muskego | 25.9 ± 3.0 | 2.0 ± 0.9 | 16.9 ± 1.7 | 60.6 ± 3.5 | 25.3 ± 3.0 | 8.4 ± 1.8 |
| Newaygo | 24.5 ± 5.3 | 2.3 ± 1.9 | 18.8 ± 3.3 | 68.8 ± 6.8 | 22.2 ± 5.3 | 9.3 ± 3.6 |
| Oakland | 25.4 ± 1.1 | 1.7 ± 0.3 | 15.9 ± 0.6 | 48.9 ± 1.2 | 24.9 ± 1.1 | 8.9 ± 0.7 |
| Oceana | 23.9 ± 7.0 | 4.3 ± 3.5 | 14.1 ± 4.0 | 39.2 ± 6.7 | 19.3 ± 5.5 | 9.2 ± 4.5 |
| Ogemaw | 23.7 ± 7.2 | 4.0 ± 3.7 | 19.2 ± 4.6 | 75.0 ± 9.2 | 15.3 ± 5.8 | 11.6 ± 5.3 |
| Ontonago | 21.8 ± 12.6 | 4.0 ± 5.7 | 16.6 ± 6.4 | 57.5 ± 12.8 | 20.4 ± 8.6 | 5.2 ± 4.9 |
| Osceola | 23.9 ± 7.5 | 1.7 ± 2.5 | 21.0 ± 4.8 | 62.4 ± 9.0 | 19.6 ± 6.7 | 8.1 ± 4.4 |
| Oscoda | 32.7 ± 13.8 | 0.0 ± 0.0 | 18.7 ± 7.4 | 62.4 ± 12.6 | 21.0 ± 10.0 | 9.0 ± 7.0 |
| Otsego | 20.3 ± 6.6 | 2.3 ± 2.3 | 21.1 ± 4.5 | 50.6 ± 8.0 | 21.4 ± 5.9 | 7.7 ± 4.2 |
| Ottawa | 22.0 ± 2.5 | 1.0 ± 0.6 | 14.1 ± 1.4 | 36.6 ± 2.5 | 23.2 ± 2.4 | 8.0 ± 1.6 |
| Presque | 15.5 ± 7.5 | 0.7 ± 1.3 | 16.5 ± 4.3 | 52.9 ± 8.9 | 13.7 ± 5.3 | 9.2 ± 5.8 |
| Roscomm | 18.5 ± 5.8 | 1.5 ± 2.3 | 18.2 ± 4.0 | 68.1 ± 7.5 | 23.4 ± 4.9 | 9.1 ± 3.9 |
| Saginaw | 24.4 ± 2.6 | 2.8 ± 1.0 | 18.9 ± 1.6 | 57.5 ± 3.0 | 25.3 ± 2.6 | 7.8 ± 1.5 |
| St. Clair | 28.7 ± 3.3 | 2.4 ± 0.9 | 21.3 ± 2.0 | 64.7 ± 3.6 | 26.6 ± 2.8 | 9.1 ± 1.8 |
| St. Joseph | 21.8 ± 4.7 | 2.9 ± 1.9 | 23.6 ± 3.4 | 62.3 ± 5.8 | 26.7 ± 5.0 | 11.7 ± 3.4 |
| Sanilac | 24.1 ± 5.7 | 1.8 ± 1.8 | 18.7 ± 3.3 | 55.3 ± 6.0 | 27.7 ± 4.4 | 7.7 ± 3.2 |
| Schoolcra | 28.2 ± 12.3 | 1.4 ± 2.7 | 23.5 ± 7.8 | 65.4 ± 13.5 | 25.0 ± 8.9 | 8.1 ± 7.2 |
| Shiawassee | 24.3 ± 4.5 | 3.1 ± 1.8 | 17.1 ± 2.7 | 52.7 ± 5.0 | 19.7 ± 4.0 | 12.1 ± 3.2 |
| Tuscola | 23.6 ± 5.0 | 1.5 ± 1.3 | 20.7 ± 3.3 | 54.5 ± 5.6 | 27.9 ± 5.1 | 9.3 ± 3.1 |
| Van | 22.7 ± 4.4 | 1.5 ± 1.2 | 20.4 ± 2.8 | 57.6 ± 5.0 | 24.4 ± 4.1 | 9.3 ± 2.8 |
| Washtena | 24.3 ± 2.4 | 1.3 ± 0.6 | 17.1 ± 1.4 | 45.3 ± 2.5 | 27.2 ± 2.5 | 9.5 ± 1.6 |
| Wayne | 29.5 ± 1.0 | 3.0 ± 0.3 | 21.1 ± 0.6 | 62.0 ± 1.1 | 30.9 ± 1.0 | 8.2 ± 0.5 |
| Wexford | 16.4 ± 5.6 | 1.1 ± 1.5 | 17.7 ± 4.0 | 51.8 ± 7.2 | 27.2 ± 6.8 | 8.5 ± 3.6 |
| Michigan | 24.2 ± 0.4 | 2.0 ± 0.1 | 16.7 ± 0.2 | 54.5 ± 0.4 | 21.9 ± 0.4 | 8.0 ± 0.2 |

*Age-adjusted rate per 100,000 population computed by gender for breast, cervical and prostate cancer.

**Table 2: Breast, Cervical, Colorectal, Lung, Prostate, and Ovarian Cancer
Incidence Rates by County, Michigan 1998-2007**

| County | Breast | Cervical | Colorectal | Lung | Prostate | Ovarian |
|------------|--------------|-------------|-------------|-------------|--------------|-------------|
| Alcona | 132.7 ± 24.0 | 78.4 ± 27.2 | 55.8 ± 10.0 | 83.5 ± 12.3 | 123.2 ± 20.3 | 19.9 ± 11.2 |
| Alger | 132.4 ± 28.4 | 33.4 ± 17.9 | 60.9 ± 12.6 | 78.1 ± 14.9 | 143.2 ± 27.8 | 15.2 ± 10.9 |
| Allegan | 132.1 ± 9.3 | 40.0 ± 5.4 | 55.5 ± 4.2 | 68.3 ± 4.9 | 165.1 ± 11.0 | 15.9 ± 3.1 |
| Alpena | 134.1 ± 16.0 | 99.1 ± 17.0 | 59.7 ± 7.2 | 78.5 ± 8.4 | 139.2 ± 16.1 | 18.3 ± 5.9 |
| Antrim | 119.4 ± 17.4 | 88.6 ± 18.4 | 53.1 ± 7.7 | 67.6 ± 8.7 | 204.8 ± 21.0 | 13.0 ± 5.9 |
| Arenac | 106.9 ± 19.6 | 49.8 ± 16.3 | 68.0 ± 10.1 | 94.8 ± 12.5 | 171.2 ± 23.0 | 10.9 ± 6.1 |
| Baraga | 121.0 ± 29.2 | 26.8 ± 17.1 | 49.4 ± 12.8 | 98.7 ± 18.5 | 139.8 ± 31.3 | 8.0 ± 7.9 |
| Barry | 124.5 ± 12.1 | 38.6 ± 7.4 | 46.0 ± 5.1 | 60.5 ± 6.1 | 155.3 ± 13.9 | 12.8 ± 3.8 |
| Bay | 117.7 ± 8.2 | 49.7 ± 6.1 | 54.0 ± 3.8 | 81.8 ± 4.8 | 180.3 ± 10.5 | 17.5 ± 3.1 |
| Benzie | 120.8 ± 20.8 | 115. ± 24.3 | 56.1 ± 9.2 | 74.9 ± 11.0 | 210.6 ± 26.0 | 11.8 ± 6.9 |
| Berrien | 131.3 ± 7.1 | 61.3 ± 5.5 | 58.3 ± 3.3 | 79.0 ± 3.9 | 206.3 ± 9.3 | 15.6 ± 2.5 |
| Branch | 103.7 ± 12.3 | 43.8 ± 8.7 | 49.5 ± 5.8 | 79.0 ± 7.6 | 132.4 ± 14.3 | 11.0 ± 3.8 |
| Calhoun | 118.1 ± 7.4 | 65.9 ± 6.1 | 53.2 ± 3.4 | 80.5 ± 4.4 | 146.3 ± 8.7 | 16.9 ± 2.8 |
| Cass | 107.3 ± 11.4 | 46.8 ± 8.7 | 46.0 ± 5.2 | 71.8 ± 6.6 | 124.2 ± 12.5 | 13.7 ± 4.2 |
| Charlevoix | 125.5 ± 17.2 | 62.4 ± 14.1 | 47.2 ± 7.1 | 63.9 ± 8.6 | 146.5 ± 18.6 | 14.0 ± 5.9 |
| Cheboygan | 127.1 ± 16.6 | 40.1 ± 11.5 | 50.1 ± 7.1 | 75.1 ± 8.5 | 181.1 ± 19.1 | 16.3 ± 5.9 |
| Chippewa | 116.7 ± 15.0 | 21.5 ± 7.2 | 46.3 ± 6.4 | 75.9 ± 8.3 | 137.1 ± 16.0 | 17.0 ± 5.7 |
| Clare | 116.0 ± 14.9 | 27.1 ± 8.5 | 56.3 ± 6.8 | 94.9 ± 9.1 | 189.6 ± 17.7 | 13.6 ± 5.3 |
| Clinton | 89.3 ± 9.7 | 23.8 ± 5.3 | 42.8 ± 4.7 | 44.3 ± 5.1 | 161.2 ± 13.8 | 10.8 ± 3.4 |
| Crawford | 98.8 ± 20.6 | 30.6 ± 13.8 | 45.3 ± 9.4 | 80.5 ± 12.4 | 169.6 ± 25.0 | 16.0 ± 8.4 |
| Delta | 125.7 ± 13.9 | 39.7 ± 9.5 | 57.1 ± 6.3 | 65.2 ± 7.0 | 167.1 ± 15.8 | 11.1 ± 4.1 |
| Dickinson | 115.9 ± 16.0 | 43.3 ± 12.0 | 53.6 ± 7.2 | 59.5 ± 7.8 | 143.4 ± 17.8 | 12.0 ± 5.0 |
| Eaton | 93.4 ± 7.7 | 34.5 ± 5.0 | 38.1 ± 3.5 | 51.3 ± 4.2 | 152.3 ± 10.6 | 10.1 ± 2.5 |
| Emmet | 147.4 ± 16.9 | 43.5 ± 10.6 | 50.5 ± 6.9 | 72.6 ± 8.3 | 155.7 ± 18.1 | 22.8 ± 6.7 |
| Genesee | 133.9 ± 4.5 | 81.5 ± 3.7 | 56.7 ± 2.1 | 86.4 ± 2.7 | 210.8 ± 6.2 | 15.0 ± 1.5 |
| Gladwin | 106.0 ± 15.1 | 21.8 ± 8.3 | 55.6 ± 6.9 | 90.9 ± 9.4 | 184.6 ± 18.1 | 10.5 ± 4.7 |
| Gogebic | 116.7 ± 19.9 | 45.4 ± 16.2 | 50.8 ± 8.3 | 63.3 ± 9.6 | 151.8 ± 20.7 | 16.9 ± 8.1 |
| Grand | 156.4 ± 11.1 | 142. ± 11.8 | 52.0 ± 4.5 | 71.5 ± 5.5 | 280.7 ± 15.9 | 16.5 ± 3.6 |
| Gratiot | 121.7 ± 14.2 | 30.8 ± 7.8 | 55.6 ± 6.5 | 63.3 ± 7.3 | 167.6 ± 17.1 | 17.7 ± 5.4 |
| Hillsdale | 114.1 ± 12.6 | 39.4 ± 8.4 | 49.9 ± 5.7 | 61.8 ± 6.5 | 131.7 ± 13.8 | 14.4 ± 4.7 |
| Houghton | 127.4 ± 16.1 | 35.6 ± 10.0 | 49.9 ± 6.5 | 60.1 ± 7.4 | 147.8 ± 16.5 | 13.3 ± 5.2 |
| Huron | 126.6 ± 14.6 | 44.6 ± 10.9 | 66.1 ± 6.8 | 62.9 ± 6.7 | 201.0 ± 17.2 | 15.1 ± 5.0 |
| Ingham | 146.8 ± 6.4 | 28.4 ± 2.7 | 57.3 ± 2.9 | 70.8 ± 3.4 | 206.2 ± 8.6 | 17.1 ± 2.2 |
| Ionia | 119.9 ± 12.3 | 37.6 ± 7.1 | 48.2 ± 5.5 | 67.2 ± 6.7 | 164.4 ± 15.3 | 9.4 ± 3.5 |
| Iosco | 118.8 ± 15.5 | 38.0 ± 11.7 | 52.5 ± 6.6 | 87.6 ± 8.7 | 175.1 ± 16.9 | 14.3 ± 5.7 |
| Iron | 109.1 ± 21.8 | 25.0 ± 14.3 | 56.0 ± 10.4 | 80.6 ± 12.2 | 128.2 ± 21.8 | 18.0 ± 9.9 |
| Isabella | 114.5 ± 12.7 | 20.8 ± 5.3 | 55.8 ± 6.2 | 78.0 ± 7.6 | 155.3 ± 15.6 | 12.2 ± 4.1 |
| Jackson | 117.0 ± 7.0 | 44.5 ± 4.8 | 48.3 ± 3.1 | 80.0 ± 4.2 | 144.3 ± 8.1 | 15.3 ± 2.5 |
| Kalamazoo | 122.5 ± 6.0 | 56.8 ± 4.1 | 44.3 ± 2.6 | 68.8 ± 3.3 | 161.5 ± 7.7 | 15.3 ± 2.1 |
| Kalkaska | 97.8 ± 19.0 | 96.0 ± 21.8 | 50.5 ± 9.4 | 66.6 ± 11.3 | 166.2 ± 25.1 | 16.4 ± 8.1 |
| Kent | 131.0 ± 4.1 | 34.5 ± 2.1 | 45.3 ± 1.7 | 59.3 ± 2.1 | 165.8 ± 5.1 | 12.7 ± 1.3 |
| Keweenaw | 129.3 ± 55.9 | 20.2 ± 31.6 | 41.3 ± 20.3 | 61.7 ± 24.6 | 82.2 ± 39.1 | 9.6 ± 13.2 |

* Age-adjusted rate per 100,000 population computed by gender for breast, cervical and prostate cancer.

Appendix II

Incidence Rates by County

| County | Breast | Cervical | Colorectal | Lung | Prostate | Ovarian |
|--------------|--------------|-------------|-------------|-------------|--------------|-------------|
| Lake | 129.7 ± 26.3 | 39.3 ± 18.1 | 59.1 ± 11.0 | 94.6 ± 14.5 | 217.6 ± 29.2 | 19.8 ± 10.6 |
| Lapeer | 119.9 ± 9.7 | 81.6 ± 8.5 | 59.4 ± 5.0 | 72.7 ± 5.7 | 178.8 ± 12.9 | 15.7 ± 3.5 |
| Leelanau | 124.4 ± 18.7 | 80.4 ± 19.3 | 33.9 ± 6.1 | 36.1 ± 6.5 | 250.9 ± 24.1 | 11.3 ± 5.7 |
| Lenawee | 118.7 ± 8.8 | 43.5 ± 5.9 | 43.8 ± 3.8 | 63.3 ± 4.7 | 177.4 ± 11.4 | 14.1 ± 3.0 |
| Livingston | 117.6 ± 7.3 | 37.2 ± 4.2 | 47.2 ± 3.4 | 61.1 ± 4.0 | 139.9 ± 8.8 | 13.5 ± 2.5 |
| Luce | 124.1 ± 24.3 | 62.1 ± 30.2 | 72.6 ± 16.8 | 75.5 ± 18.5 | 161.2 ± 38.7 | 15.8 ± 11.9 |
| Mackinac | 102.9 ± 22.4 | 35.9 ± 17.1 | 46.2 ± 9.7 | 84.5 ± 13.6 | 137.7 ± 24.3 | 11.3 ± 8.0 |
| Macomb | 130.5 ± 3.2 | 85.5 ± 2.9 | 54.9 ± 1.5 | 81.4 ± 1.8 | 183.2 ± 4.1 | 16.2 ± 1.1 |
| Manistee | 129.9 ± 17.7 | 67.0 ± 16.0 | 59.9 ± 7.7 | 66.4 ± 8.5 | 182.1 ± 20.0 | 18.0 ± 6.5 |
| Marquette | 134.2 ± 11.7 | 12.9 ± 4.0 | 48.2 ± 4.9 | 72.7 ± 6.1 | 145.5 ± 12.5 | 13.2 ± 3.7 |
| Mason | 131.4 ± 16.5 | 48.7 ± 12.1 | 47.1 ± 6.6 | 75.5 ± 8.4 | 165.8 ± 18.0 | 14.2 ± 5.4 |
| Mecosta | 111.1 ± 13.8 | 28.6 ± 7.7 | 40.6 ± 5.6 | 72.9 ± 7.8 | 173.2 ± 16.9 | 11.5 ± 4.3 |
| Menominee | 114.3 ± 16.4 | 23.6 ± 9.1 | 37.6 ± 6.3 | 61.1 ± 8.3 | 145.3 ± 17.8 | 11.9 ± 5.6 |
| Midland | 115.7 ± 9.5 | 18.2 ± 4.1 | 46.4 ± 4.3 | 60.9 ± 5.1 | 181.6 ± 13.0 | 12.7 ± 3.2 |
| Missaukee | 134.8 ± 24.2 | 64.8 ± 19.0 | 48.7 ± 10.0 | 75.3 ± 12.5 | 172.5 ± 26.7 | 16.3 ± 7.8 |
| Monroe | 103.5 ± 6.9 | 43.0 ± 4.7 | 53.1 ± 3.5 | 73.2 ± 4.3 | 144.7 ± 8.8 | 14.5 ± 2.6 |
| Montcalm | 123.3 ± 11.9 | 34.5 ± 6.7 | 52.7 ± 5.3 | 77.4 ± 6.7 | 190.9 ± 15.0 | 10.3 ± 3.5 |
| Montmorency | 135.4 ± 26.2 | 98.4 ± 30.4 | 52.7 ± 11.0 | 89.0 ± 13.7 | 201.3 ± 28.3 | 19.9 ± 11.1 |
| Muskegon | 140.2 ± 7.4 | 133.2 ± 7.8 | 51.3 ± 3.2 | 76.0 ± 3.9 | 212.9 ± 9.7 | 14.1 ± 2.4 |
| Newaygo | 125.1 ± 13.1 | 57.6 ± 10.0 | 61.2 ± 6.3 | 83.7 ± 7.5 | 178.9 ± 15.9 | 15.5 ± 4.7 |
| Oakland | 143.3 ± 2.8 | 80.8 ± 2.3 | 52.0 ± 1.2 | 70.0 ± 1.5 | 212.7 ± 3.8 | 15.4 ± 0.9 |
| Oceana | 131.2 ± 17.9 | 83.2 ± 15.9 | 48.5 ± 7.1 | 59.1 ± 8.4 | 168.8 ± 19.8 | 15.0 ± 6.2 |
| Ogemaw | 103.7 ± 16.3 | 19.5 ± 8.9 | 53.3 ± 7.8 | 86.6 ± 10.1 | 163.7 ± 19.5 | 14.6 ± 6.1 |
| Ontonagon | 111.0 ± 28.0 | 52.4 ± 26.7 | 51.6 ± 12.0 | 70.5 ± 14.4 | 136.8 ± 28.1 | 17.0 ± 10.7 |
| Osceola | 138.3 ± 19.2 | 48.2 ± 13.2 | 60.3 ± 8.8 | 83.5 ± 10.5 | 227.3 ± 24.4 | 15.3 ± 6.5 |
| Oscoda | 113.0 ± 25.6 | 18.5 ± 12.9 | 49.7 ± 11.0 | 62.4 ± 12.6 | 129.5 ± 25.0 | 5.2 ± 5.1 |
| Otsego | 123.6 ± 18.2 | 98.5 ± 18.5 | 55.3 ± 8.1 | 68.9 ± 9.4 | 210.2 ± 23.2 | 10.8 ± 5.4 |
| Ottawa | 140.2 ± 6.6 | 28.9 ± 3.0 | 47.8 ± 2.7 | 48.3 ± 2.9 | 165.2 ± 7.7 | 14.8 ± 2.2 |
| Presque Isle | 108.7 ± 20.5 | 62.5 ± 20.5 | 51.8 ± 8.9 | 73.1 ± 10.8 | 172.7 ± 23.6 | 21.9 ± 9.8 |
| Roscommon | 146.7 ± 17.4 | 40.3 ± 12.6 | 58.4 ± 7.1 | 93.1 ± 9.1 | 199.7 ± 18.1 | 10.9 ± 4.5 |
| Saginaw | 121.9 ± 6.1 | 78.2 ± 5.4 | 54.5 ± 2.9 | 77.9 ± 3.5 | 214.9 ± 8.7 | 12.7 ± 2.0 |
| St. Clair | 139.1 ± 7.4 | 78.4 ± 6.1 | 62.7 ± 3.5 | 86.0 ± 4.2 | 169.7 ± 8.7 | 16.8 ± 2.6 |
| St. Joseph | 113.0 ± 11.0 | 77.8 ± 10.1 | 57.3 ± 5.4 | 78.6 ± 6.5 | 130.4 ± 12.3 | 16.3 ± 4.2 |
| Sanilac | 114.4 ± 12.7 | 74.8 ± 12.0 | 55.1 ± 5.9 | 68.0 ± 6.7 | 162.0 ± 15.1 | 11.2 ± 4.0 |
| Schoolcraft | 119.6 ± 27.9 | 36.4 ± 19.5 | 59.2 ± 12.8 | 90.5 ± 16.2 | 169.1 ± 32.3 | 13.0 ± 10.0 |
| Shiawassee | 124.5 ± 10.6 | 52.2 ± 7.6 | 53.6 ± 5.0 | 70.5 ± 5.8 | 185.7 ± 14.0 | 16.3 ± 3.9 |
| Tuscola | 118.8 ± 11.6 | 54.8 ± 8.9 | 61.4 ± 5.8 | 68.1 ± 6.3 | 172.5 ± 14.3 | 15.2 ± 4.2 |
| Van Wert | 106.5 ± 9.5 | 51.7 ± 7.3 | 42.0 ± 4.2 | 68.1 ± 5.6 | 155.5 ± 12.2 | 17.5 ± 3.9 |
| Washtenaw | 139.3 ± 5.9 | 40.6 ± 2.9 | 49.6 ± 2.6 | 60.0 ± 3.0 | 182.0 ± 7.5 | 15.6 ± 2.0 |
| Wayne | 123.8 ± 2.0 | 84.3 ± 1.8 | 60.6 ± 1.0 | 87.4 ± 1.3 | 217.0 ± 3.0 | 13.7 ± 0.7 |
| Wexford | 124.7 ± 16.0 | 82.5 ± 14.7 | 57.7 ± 7.3 | 72.3 ± 8.7 | 216.4 ± 21.7 | 12.1 ± 4.9 |
| Michigan | 128.0 ± 0.9 | 65.4 ± 0.7 | 53.8 ± 0.4 | 75.0 ± 0.5 | 188.8 ± 1.2 | 14.6 ± 0.3 |

*Age-adjusted rate per 100,000 population computed by gender for breast, cervical and prostate cancer.

Table 3: Percentage of Breast Cancer Cases Localized at Diagnosis by County, 1995-1997 and 2005-2007

| County | 1995-1997 | 2005-2007 |
|-----------------------|------------------|------------------|
| Alcona | 51.4% | 64.9% |
| Alger | 66.7% | 57.7% |
| Allegan | 54.5% | 61.5% |
| Alpena | 71.8% | 70.1% |
| Antrim | 41.1% | 72.9% |
| Arenac | 63.6% | 50.0% |
| Baraga | 33.3% | 50.0% |
| Barry | 59.5% | 66.7% |
| Bay | 45.5% | 62.8% |
| Benzie | 59.0% | 57.8% |
| Berrien | 62.0% | 54.8% |
| Branch | 56.9% | 57.3% |
| Calhoun | 63.3% | 59.4% |
| Cass | 49.5% | 63.3% |
| Charlevoix | 49.2% | 66.7% |
| Cheboygan | 67.9% | 63.5% |
| Chippewa | 61.5% | 65.3% |
| Clare | 64.9% | 64.4% |
| Clinton | 59.8% | 69.1% |
| Crawford | 37.8% | 60.0% |
| Delta | 79.6% | 67.1% |
| Dickinson | 23.0% | 72.3% |
| Eaton | 55.0% | 66.5% |
| Emmet | 75.9% | 72.3% |
| Genesee | 59.0% | 62.3% |
| Gladwin | 63.5% | 64.3% |
| Gogebic | 54.1% | 60.0% |
| Grand Traverse | 62.8% | 65.0% |
| Gratiot | 53.8% | 59.4% |
| Hillsdale | 65.2% | 60.0% |
| Houghton | 58.7% | 67.4% |
| Huron | 34.8% | 50.6% |
| Ingham | 60.7% | 62.6% |
| Ionia | 45.9% | 58.3% |
| Iosco | 64.7% | 60.9% |
| Iron | 55.0% | 80.8% |
| Isabella | 32.7% | 60.0% |
| Jackson | 64.2% | 57.8% |
| Kalamazoo | 57.1% | 60.7% |
| Kalkaska | 57.1% | 41.7% |
| Kent | 65.0% | 65.9% |
| Keweenaw | 20.0% | 71.4% |

| County | 1995-1997 | 2005-2007 |
|---------------------|------------------|------------------|
| Lake | 54.2% | 65.0% |
| Lapeer | 57.9% | 55.9% |
| Leelanau | 37.1% | 74.5% |
| Lenawee | 56.8% | 69.4% |
| Livingston | 62.8% | 65.5% |
| Luce | 77.8% | 57.1% |
| Mackinac | 71.0% | 69.6% |
| Macomb | 60.9% | 62.6% |
| Manistee | 49.2% | 60.9% |
| Marquette | 64.7% | 68.9% |
| Mason | 58.3% | 70.0% |
| Mecosta | 59.3% | 63.1% |
| Menominee | 53.2% | 51.4% |
| Midland | 71.3% | 52.7% |
| Missaukee | 53.1% | 64.5% |
| Monroe | 63.4% | 58.9% |
| Montcalm | 53.2% | 56.3% |
| Montmorency | 51.9% | 71.4% |
| Muskegon | 56.9% | 64.8% |
| Newaygo | 70.0% | 64.6% |
| Oakland | 63.8% | 62.3% |
| Oceana | 54.7% | 44.6% |
| Ogemaw | 56.9% | 61.0% |
| Ontonagon | 44.4% | 75.0% |
| Osceola | 45.8% | 74.5% |
| Oscoda | 66.7% | 55.0% |
| Otsego | 43.1% | 67.2% |
| Ottawa | 54.0% | 63.3% |
| Presque Isle | 68.2% | 70.4% |
| Roscommon | 56.8% | 59.0% |
| Saginaw | 61.7% | 64.3% |
| St. Clair | 63.1% | 68.1% |
| St. Joseph | 59.4% | 65.7% |
| Sanilac | 52.1% | 53.7% |
| Schoolcraft | 78.3% | 55.0% |
| Shiawassee | 73.8% | 64.3% |
| Tuscola | 57.0% | 53.8% |
| Van Buren | 60.8% | 64.3% |
| Washtenaw | 72.1% | 67.4% |
| Wayne | 59.4% | 58.9% |
| Wexford | 44.1% | 69.7% |
| Michigan | 60.4% | 62.2% |

Table 4: Percentage of Cervical Cancer Cases In-situ at Diagnosis by County,
1995-1997 and 2005-2007

| County | 1995-1997 | 2005-2007 |
|-----------------------|-------------------|-------------------|
| Alcona | 100.0% | 100.0% |
| Alger | 80.0% | 100.0% |
| Allegan | 82.8% | 83.3% |
| Alpena | 95.0% | 91.1% |
| Antrim | 90.9% | 92.3% |
| Arenac | 60.0% | 100.0% |
| Baraga | 83.3% | 40.0% |
| Barry | 80.0% | 86.5% |
| Bay | 79.4% | 86.4% |
| Benzie | 81.3% | 100.0% |
| Berrien | 68.3% | 84.6% |
| Branch | 78.9% | 73.7% |
| Calhoun | 67.9% | 87.1% |
| Cass | 66.7% | 71.4% |
| Charlevoix | 78.6% | 76.2% |
| Cheboygan | 57.9% | 55.6% |
| Chippewa | 75.0% | 30.8% |
| Clare | 73.3% | 40.0% |
| Clinton | 64.3% | 76.5% |
| Crawford | 93.8% | 87.5% |
| Delta | 72.2% | 75.0% |
| Dickinson | 61.5% | 100.0% |
| Eaton | 77.2% | 83.7% |
| Emmet | 74.2% | 69.2% |
| Genesee | 83.2% | 89.4% |
| Gladwin | 65.0% | 0.0% |
| Gogebic | 94.7% | 66.7% |
| Grand Traverse | 91.8% | 93.3% |
| Gratiot | 65.4% | 33.3% |
| Hillsdale | 27.3% | 81.5% |
| Houghton | 68.4% | 71.4% |
| Huron | 82.4% | 77.8% |
| Ingham | 82.1% | 73.2% |
| Ionia | 87.5% | 75.0% |
| Iosco | 60.0% | 50.0% |
| Iron | 57.1% | 60.0% |
| Isabella | 75.0% | 40.9% |
| Jackson | 76.4% | 78.7% |
| Kalamazoo | 87.3% | 89.9% |
| Kalkaska | 87.5% | 100.0% |
| Kent | 85.9% | 83.2% |
| Keweenaw | No cases reported | No Cases Reported |

| County | 1995-1997 | 2005-2007 |
|---------------|------------------|------------------|
| Lake | 72.7% | 66.7% |
| Lapeer | 92.8% | 83.7% |
| Leelanau | 90.9% | 92.3% |
| Lenawee | 70.7% | 79.7% |
| Livingston | 84.8% | 83.3% |
| Luce | 66.7% | 50.0% |
| Mackinac | 77.8% | 50.0% |
| Macomb | 88.9% | 90.0% |
| Manistee | 69.2% | 95.5% |
| Marquette | 76.5% | 50.0% |
| Mason | 69.2% | 84.8% |
| Mecosta | 52.2% | 71.4% |
| Menominee | 62.5% | 20.0% |
| Midland | 81.5% | 52.9% |
| Missaukee | 81.8% | 100.0% |
| Monroe | 78.6% | 78.9% |
| Montcalm | 79.1% | 88.9% |
| Montmorency | 85.7% | 94.1% |
| Muskegon | 80.0% | 95.1% |
| Newaygo | 77.8% | 87.2% |
| Oakland | 89.6% | 89.6% |
| Oceana | 44.4% | 85.4% |
| Ogemaw | 50.0% | 66.7% |
| Ontonagon | 83.3% | 33.3% |
| Osceola | 77.8% | 86.7% |
| Oscoda | 75.0% | 100.0% |
| Otsego | 81.8% | 88.4% |
| Ottawa | 73.9% | 82.4% |
| Presque Isle | 81.8% | 69.2% |
| Roscommon | 86.7% | 53.3% |
| Saginaw | 79.2% | 84.3% |
| St. Clair | 89.6% | 83.8% |
| St. Joseph | 69.2% | 68.6% |
| Sanilac | 77.8% | 88.9% |
| Schoolcraft | 83.3% | 50.0% |
| Shiawassee | 85.9% | 92.9% |
| Tuscola | 71.1% | 83.8% |
| Van Buren | 88.1% | 75.0% |
| Washtenaw | 76.4% | 87.3% |
| Wayne | 85.8% | 86.7% |
| Wexford | 88.0% | 93.3% |
| Michigan | 84.5% | 86.6% |

Table 5: Percentage of Colorectal Cancer Cases Localized at Diagnosis by
County, 1995-1997 and 2005-2007

| County | 1995-1997 | 2005-2007 |
|-----------------------|------------------|-------------------|
| Alcona | 32.0% | 48.6% |
| Alger | 34.8% | 32.3% |
| Allegan | 25.6% | 43.6% |
| Alpena | 25.4% | 48.5% |
| Antrim | 27.8% | 44.6% |
| Arenac | 48.7% | 40.5% |
| Baraga | 57.1% | 44.4% |
| Barry | 34.4% | 47.1% |
| Bay | 30.6% | 51.1% |
| Benzie | 25.8% | 37.8% |
| Berrien | 31.4% | 40.7% |
| Branch | 39.3% | 23.8% |
| Calhoun | 28.9% | 37.2% |
| Cass | 26.0% | 36.6% |
| Charlevoix | 27.3% | 32.7% |
| Cheboygan | 39.6% | 37.7% |
| Chippewa | 40.5% | 42.9% |
| Clare | 31.1% | 54.2% |
| Clinton | 32.4% | 48.7% |
| Crawford | 38.1% | 50.0% |
| Delta | 71.0% | 46.2% |
| Dickinson | 19.4% | 50.8% |
| Eaton | 28.4% | 46.0% |
| Emmet | 37.0% | 50.0% |
| Genesee | 30.7% | 44.7% |
| Gladwin | 40.7% | 41.7% |
| Gogebic | 26.2% | 41.7% |
| Grand Traverse | 33.6% | 38.0% |
| Gratiot | 51.9% | 32.0% |
| Hillsdale | 40.0% | 42.9% |
| Houghton | 32.1% | 30.9% |
| Huron | 13.9% | 42.1% |
| Ingham | 36.0% | 43.7% |
| Ionia | 33.3% | 31.9% |
| Iosco | 43.3% | 43.2% |
| Iron | 14.0% | 38.9% |
| Isabella | 26.2% | 54.9% |
| Jackson | 55.9% | 33.6% |
| Kalamazoo | 23.3% | 27.1% |
| Kalkaska | 32.1% | 37.5% |
| Kent | 23.5% | 38.9% |
| Keweenaw | 33.3% | No Cases Reported |

| County | 1995-1997 | 2005-2007 |
|---------------|------------------|------------------|
| Lake | 27.6% | 32.3% |
| Lapeer | 31.9% | 39.5% |
| Leelanau | 45.8% | 60.0% |
| Lenawee | 37.8% | 36.6% |
| Livingston | 30.5% | 37.0% |
| Luce | 36.4% | 47.1% |
| Mackinac | 15.2% | 52.6% |
| Macomb | 35.4% | 38.7% |
| Manistee | 36.7% | 31.3% |
| Marquette | 37.3% | 44.2% |
| Mason | 37.3% | 37.1% |
| Mecosta | 26.4% | 39.2% |
| Menominee | 41.7% | 31.8% |
| Midland | 27.8% | 44.7% |
| Missaukee | 21.1% | 47.4% |
| Monroe | 27.9% | 29.4% |
| Montcalm | 25.7% | 44.3% |
| Montmorency | 8.7% | 50.0% |
| Muskegon | 32.7% | 41.3% |
| Newaygo | 47.2% | 44.3% |
| Oakland | 38.2% | 41.2% |
| Oceana | 27.0% | 42.9% |
| Ogemaw | 31.9% | 41.5% |
| Ontonagon | 13.6% | 31.6% |
| Osceola | 24.2% | 32.5% |
| Oscoda | 33.3% | 34.8% |
| Otsego | 19.5% | 30.2% |
| Ottawa | 30.4% | 46.3% |
| Presque Isle | 31.6% | 52.5% |
| Roscommon | 43.1% | 41.7% |
| Saginaw | 49.1% | 43.8% |
| St. Clair | 37.8% | 36.8% |
| St. Joseph | 26.8% | 25.5% |
| Sanilac | 22.0% | 46.5% |
| Schoolcraft | 28.6% | 43.5% |
| Shiawassee | 37.2% | 45.0% |
| Tuscola | 32.0% | 32.0% |
| Van Buren | 32.1% | 35.0% |
| Washtenaw | 40.3% | 38.7% |
| Wayne | 34.0% | 37.8% |
| Wexford | 15.6% | 43.1% |
| Michigan | 34.0% | 39.8% |

Table 6: Percentage of Lung Cancer Cases Localized at Diagnosis by County, 1995-1997 and 2005-2007

| County | 1995-1997 | 2005-2007 |
|-----------------------|------------------|------------------|
| Alcona | 22.2% | 25.6% |
| Alger | 13.6% | 14.3% |
| Allegan | 18.9% | 15.1% |
| Alpena | 15.6% | 21.1% |
| Antrim | 9.7% | 13.3% |
| Arenac | 26.0% | 16.2% |
| Baraga | 14.8% | 18.8% |
| Barry | 29.9% | 21.1% |
| Bay | 20.2% | 17.8% |
| Benzie | 22.5% | 21.4% |
| Berrien | 16.9% | 20.6% |
| Branch | 24.2% | 17.3% |
| Calhoun | 18.9% | 19.8% |
| Cass | 19.9% | 14.7% |
| Charlevoix | 18.2% | 18.0% |
| Cheboygan | 13.5% | 22.5% |
| Chippewa | 17.1% | 17.2% |
| Clare | 20.7% | 20.3% |
| Clinton | 20.5% | 18.9% |
| Crawford | 26.8% | 17.0% |
| Delta | 21.5% | 21.7% |
| Dickinson | 8.8% | 32.1% |
| Eaton | 12.4% | 15.8% |
| Emmet | 20.3% | 12.7% |
| Genesee | 20.4% | 24.6% |
| Gladwin | 14.3% | 16.7% |
| Gogebic | 10.0% | 15.1% |
| Grand Traverse | 17.2% | 12.4% |
| Gratiot | 34.3% | 7.4% |
| Hillsdale | 17.6% | 19.1% |
| Houghton | 15.2% | 20.2% |
| Huron | 16.1% | 11.6% |
| Ingham | 20.7% | 22.6% |
| Ionia | 13.4% | 23.3% |
| Iosco | 18.6% | 23.6% |
| Iron | 14.5% | 15.4% |
| Isabella | 29.7% | 19.1% |
| Jackson | 40.9% | 16.0% |
| Kalamazoo | 17.6% | 14.7% |
| Kalkaska | 4.7% | 12.8% |
| Kent | 18.3% | 16.4% |
| Keweenaw | 20.0% | 12.5% |

| County | 1995-1997 | 2005-2007 |
|---------------|------------------|------------------|
| Lake | 16.7% | 22.2% |
| Lapeer | 19.6% | 17.9% |
| Leelanau | 34.3% | 23.8% |
| Lenawee | 24.4% | 13.2% |
| Livingston | 21.8% | 14.5% |
| Luce | 11.1% | 5.9% |
| Mackinac | 27.3% | 16.7% |
| Macomb | 20.0% | 20.0% |
| Manistee | 22.7% | 17.3% |
| Marquette | 14.4% | 25.7% |
| Mason | 14.9% | 16.3% |
| Mecosta | 24.1% | 22.4% |
| Menominee | 25.9% | 14.8% |
| Midland | 19.7% | 17.8% |
| Missaukee | 21.4% | 20.0% |
| Monroe | 14.6% | 14.5% |
| Montcalm | 22.6% | 14.4% |
| Montmorency | 28.8% | 18.8% |
| Muskegon | 22.7% | 16.4% |
| Newaygo | 13.3% | 17.8% |
| Oakland | 21.5% | 20.6% |
| Oceana | 25.9% | 16.7% |
| Ogemaw | 32.8% | 18.0% |
| Ontonagon | 19.2% | 23.1% |
| Osceola | 18.9% | 20.0% |
| Oscoda | 21.9% | 25.0% |
| Otsego | 14.9% | 15.7% |
| Ottawa | 13.1% | 25.2% |
| Presque Isle | 7.3% | 17.2% |
| Roscommon | 28.2% | 19.8% |
| Saginaw | 27.6% | 16.7% |
| St. Clair | 16.0% | 17.5% |
| St. Joseph | 24.5% | 13.3% |
| Sanilac | 18.0% | 14.9% |
| Schoolcraft | 12.5% | 18.2% |
| Shiawassee | 16.4% | 18.5% |
| Tuscola | 21.2% | 11.9% |
| Van Buren | 12.7% | 20.0% |
| Washtenaw | 17.6% | 18.5% |
| Wayne | 18.1% | 17.9% |
| Wexford | 18.0% | 20.0% |
| Michigan | 19.7% | 18.6% |

Table 7: Percentage of Prostate Cancer Cases Localized at Diagnosis by County, 1995-1997 and 2005-2007

| County | 1995-1997 | 2005-2007 |
|-----------------------|------------------|------------------|
| Alcona | 72.1% | 85.4% |
| Alger | 56.5% | 88.9% |
| Allegan | 68.5% | 70.6% |
| Alpena | 64.8% | 79.2% |
| Antrim | 60.5% | 88.3% |
| Arenac | 64.6% | 85.5% |
| Baraga | 61.1% | 68.0% |
| Barry | 74.4% | 79.1% |
| Bay | 56.9% | 86.4% |
| Benzie | 55.7% | 78.9% |
| Berrien | 64.3% | 85.5% |
| Branch | 68.5% | 77.7% |
| Calhoun | 70.3% | 83.1% |
| Cass | 40.9% | 81.9% |
| Charlevoix | 68.1% | 77.8% |
| Cheboygan | 70.0% | 82.0% |
| Chippewa | 68.9% | 88.0% |
| Clare | 42.6% | 75.9% |
| Clinton | 60.8% | 84.1% |
| Crawford | 81.0% | 88.1% |
| Delta | 76.2% | 62.4% |
| Dickinson | 28.6% | 78.8% |
| Eaton | 62.0% | 82.2% |
| Emmet | 76.4% | 84.0% |
| Genesee | 61.1% | 73.9% |
| Gladwin | 50.0% | 83.7% |
| Gogebic | 52.0% | 77.8% |
| Grand Traverse | 51.9% | 84.7% |
| Gratiot | 58.6% | 75.2% |
| Hillsdale | 63.5% | 83.2% |
| Houghton | 59.5% | 74.3% |
| Huron | 55.4% | 84.8% |
| Ingham | 64.6% | 84.7% |
| Ionia | 61.2% | 70.2% |
| Iosco | 67.9% | 77.2% |
| Iron | 37.8% | 63.0% |
| Isabella | 41.3% | 80.8% |
| Jackson | 49.0% | 82.1% |
| Kalamazoo | 66.4% | 80.8% |
| Kalkaska | 59.1% | 73.5% |
| Kent | 69.7% | 65.1% |
| Keweenaw | 50.0% | 75.0% |

| County | 1995-1997 | 2005-2007 |
|---------------|------------------|------------------|
| Lake | 66.7% | 71.0% |
| Lapeer | 72.5% | 84.3% |
| Leelanau | 63.5% | 73.7% |
| Lenawee | 77.1% | 82.4% |
| Livingston | 63.7% | 79.1% |
| Luce | 81.8% | 76.5% |
| Mackinac | 82.6% | 78.1% |
| Macomb | 76.7% | 85.2% |
| Manistee | 61.6% | 73.7% |
| Marquette | 61.1% | 83.8% |
| Mason | 67.9% | 56.5% |
| Mecosta | 55.6% | 72.9% |
| Menominee | 64.2% | 73.7% |
| Midland | 66.9% | 80.7% |
| Missaukee | 48.3% | 88.5% |
| Monroe | 68.9% | 78.8% |
| Montcalm | 62.2% | 61.5% |
| Montmorency | 52.8% | 93.8% |
| Muskegon | 70.3% | 82.7% |
| Newaygo | 64.8% | 84.6% |
| Oakland | 75.8% | 82.7% |
| Oceana | 69.6% | 77.6% |
| Ogemaw | 61.0% | 80.8% |
| Ontonagon | 67.6% | 77.8% |
| Osceola | 58.9% | 85.7% |
| Oscoda | 30.4% | 96.8% |
| Otsego | 37.8% | 89.1% |
| Ottawa | 56.8% | 66.5% |
| Presque Isle | 75.0% | 88.5% |
| Roscommon | 57.9% | 88.2% |
| Saginaw | 73.6% | 78.5% |
| St. Clair | 68.1% | 85.3% |
| St. Joseph | 72.6% | 72.5% |
| Sanilac | 48.9% | 85.1% |
| Schoolcraft | 56.3% | 65.4% |
| Shiawassee | 70.6% | 90.4% |
| Tuscola | 57.0% | 78.0% |
| Van Buren | 62.4% | 81.2% |
| Washtenaw | 72.8% | 84.3% |
| Wayne | 73.6% | 83.1% |
| Wexford | 45.9% | 91.7% |
| Michigan | 68.8% | 80.7% |

Table 8: Percentage of Ovarian Cancer Cases Localized at Diagnosis by County, 1995-1997 and 2005-2007

| County | 1995-1997 | 2005-2007 |
|-----------------------|-------------------|-------------------|
| Alcona | 25.0% | 20.0% |
| Alger | 0.0% | 0.0% |
| Allegan | 20.7% | 13.8% |
| Alpena | 9.1% | 8.3% |
| Antrim | 20.0% | 0.0% |
| Arenac | 20.0% | 0.0% |
| Baraga | 0.0% | 0.0% |
| Barry | 15.4% | 15.4% |
| Bay | 30.6% | 10.9% |
| Benzie | 0.0% | 0.0% |
| Berrien | 26.8% | 8.7% |
| Branch | 16.7% | 8.3% |
| Calhoun | 32.6% | 27.5% |
| Cass | 41.7% | 0.0% |
| Charlevoix | 0.0% | 16.7% |
| Cheboygan | 33.3% | 0.0% |
| Chippewa | 15.4% | 16.7% |
| Clare | 14.3% | 0.0% |
| Clinton | 28.6% | 11.8% |
| Crawford | 0.0% | 0.0% |
| Delta | 30.8% | 50.0% |
| Dickinson | 10.0% | 0.0% |
| Eaton | 51.7% | 0.0% |
| Emmet | 25.0% | 18.2% |
| Genesee | 20.8% | 20.6% |
| Gladwin | 35.7% | 16.7% |
| Gogebic | 12.5% | 33.3% |
| Grand Traverse | 13.0% | 18.2% |
| Gratiot | 8.3% | 0.0% |
| Hillsdale | 23.1% | 27.3% |
| Houghton | 25.0% | 27.3% |
| Huron | 14.3% | 22.2% |
| Ingham | 22.7% | 24.1% |
| Ionia | 27.3% | 20.0% |
| Iosco | 9.1% | 0.0% |
| Iron | 11.1% | 0.0% |
| Isabella | 15.4% | 9.1% |
| Jackson | 26.5% | 13.2% |
| Kalamazoo | 31.6% | 10.6% |
| Kalkaska | 33.3% | 25.0% |
| Kent | 32.7% | 14.8% |
| Keweenaw | No cases reported | No cases reported |

| County | 1995-1997 | 2005-2007 |
|---------------|------------------|-------------------|
| Lake | 0.0% | 0.0% |
| Lapeer | 16.7% | 10.5% |
| Leelanau | 25.0% | 0.0% |
| Lenawee | 32.1% | 7.7% |
| Livingston | 32.3% | 22.2% |
| Luce | 0.0% | No cases reported |
| Mackinac | 80.0% | 0.0% |
| Macomb | 27.6% | 17.9% |
| Manistee | 11.1% | 0.0% |
| Marquette | 20.0% | 7.1% |
| Mason | 36.4% | 25.0% |
| Mecosta | 28.6% | 0.0% |
| Menominee | 28.6% | 0.0% |
| Midland | 46.2% | 15.8% |
| Missaukee | 0.0% | 0.0% |
| Monroe | 21.4% | 3.7% |
| Montcalm | 37.5% | 16.7% |
| Montmorency | 40.0% | 50.0% |
| Muskegon | 15.4% | 9.1% |
| Newaygo | 33.3% | 19.0% |
| Oakland | 28.0% | 14.9% |
| Oceana | 28.6% | 33.3% |
| Ogemaw | 50.0% | 11.1% |
| Ontonagon | 0.0% | 25.0% |
| Osceola | 25.0% | 25.0% |
| Oscoda | 0.0% | No cases reported |
| Otsego | 33.3% | 0.0% |
| Ottawa | 25.0% | 22.4% |
| Presque Isle | 0.0% | 14.3% |
| Roscommon | 35.3% | 0.0% |
| Saginaw | 17.8% | 16.7% |
| St. Clair | 26.4% | 13.0% |
| St. Joseph | 21.4% | 18.2% |
| Sanilac | 15.8% | 14.3% |
| Schoolcraft | 75.0% | 0.0% |
| Shiawassee | 30.0% | 17.6% |
| Tuscola | 21.1% | 18.8% |
| Van Buren | 24.0% | 20.0% |
| Washtenaw | 26.6% | 18.6% |
| Wayne | 27.4% | 14.9% |
| Wexford | 11.1% | 25.0% |
| Michigan | 26.4% | 15.4% |

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Suggested Citation: Michigan Public Health Institute and Michigan Department of Community Health. The Cancer Burden in Michigan: Selected Statistics 1993-2011. September 2011.